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Are You Ready for Web services?

Before you take the plunge, test your Web services IQ Page 52

BY CHRISTOPHER LINDQUIST

PLUS How .Net Is Changing the CIO Role and Creating a World in Which Vendors Matter Less and Less Page 40

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Managing expectations to ensure project success Page 59

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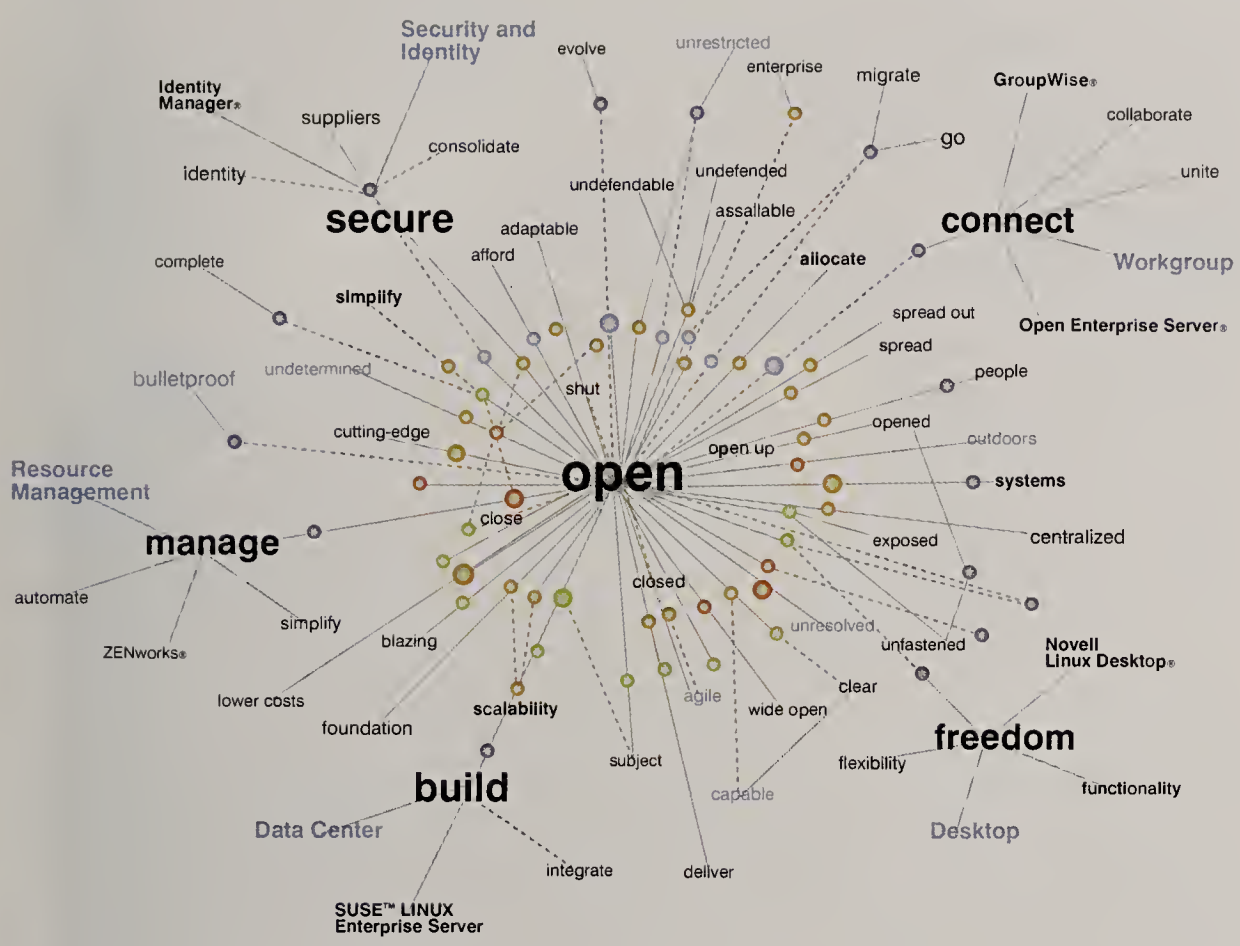

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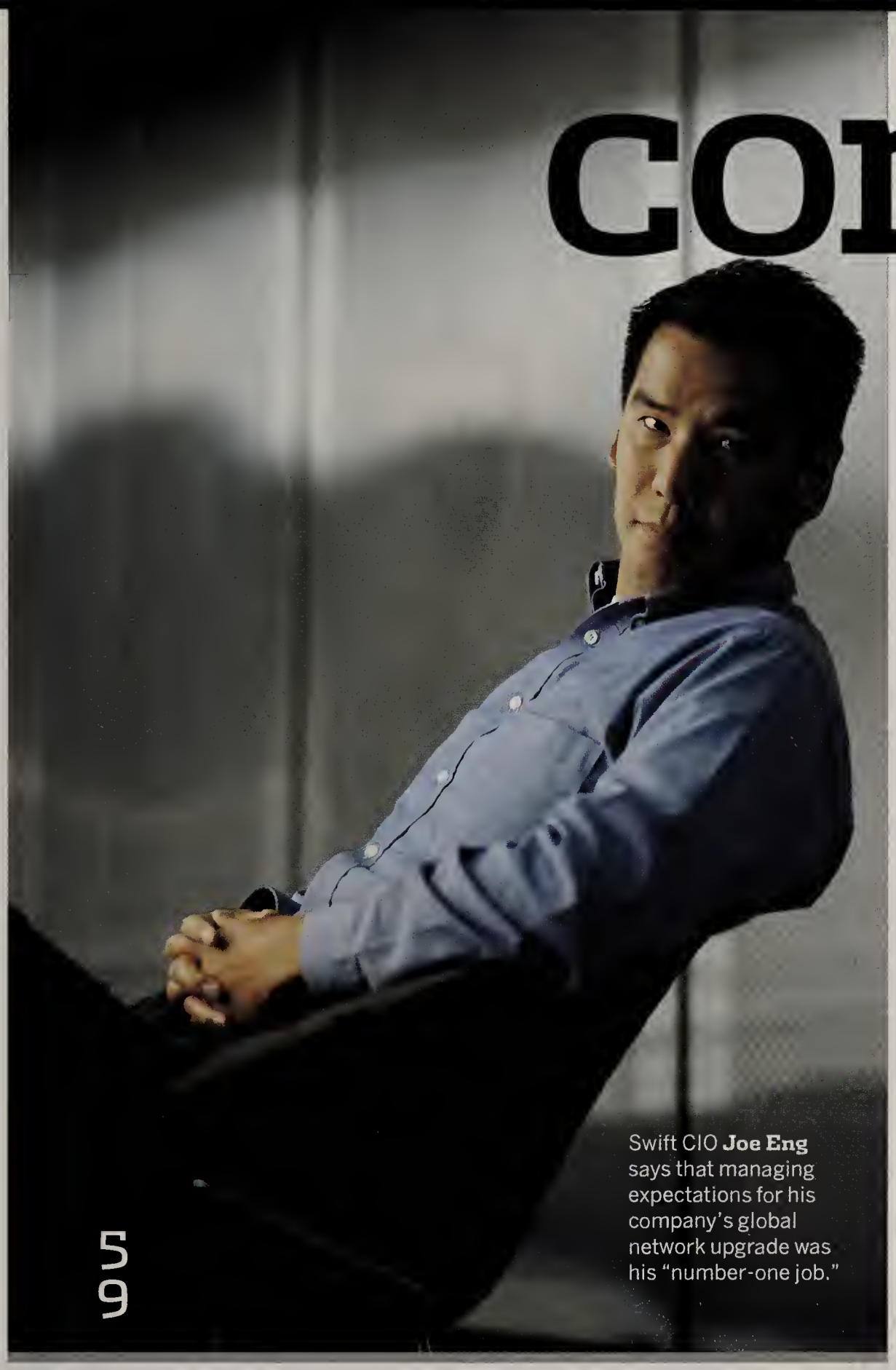

Swift CIO **Joe Eng** says that managing expectations for his company's global network upgrade was his "number-one job."

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Web Services

COVER STORY |

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Building Web services is not simply about buying technology. Nor is it just about defining business needs. Introducing Web services to your enterprise demands a deep understanding of your business culture and processes. Think you're ready? Take this quiz and find out for sure.

Feature by Christopher Lindquist

Web Services

.NET, WEB SERVICES AND THE END OF THE VENDOR ERA | 40

When Microsoft announced .Net, Bill Gates called it a "bet the company thing." But in the process of becoming far less than Microsoft had dreamed, .Net has become much more than CIOs had hoped for and is pointing the way to a new definition of the CIO role, creating a world in which vendors—including Microsoft—matter less and less. **Feature by Scott Berinato**

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Feature by Susannah Patton

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As your business clamors for more and more IT, you need a strategy for determining value. **Column by Susan Cramm**

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IT and business executives seem to hail from two alien tribes. Here's how they can come to see eye-to-eye.

Column by Mark Goulston

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CIO Joe Eng set new performance standards for his IT department, negotiated technical requirements with demanding business partners, calmed nervous end users and built a $500 million global network by following four simple principles. **Feature by Allan Holmes**

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Good decisions arise from constructive conflict. Here's how to use debate to build a sound decision-making structure. Excerpted from *Why Great Leaders Don't Take Yes for an Answer*. **By Michael A. Roberto**

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CIOs are growing increasingly frustrated at the laissez-faire attitude of many ISPs toward security. Is it time to consider regulating the ISP industry? **Feature by Matt Villano**

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Who Roots for Goliath? | Taking potshots at Microsoft has been great sport—and a great distraction—but .Net may spell the end of that game. *By David Rosenbaum*

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Wh@t's Hot Online

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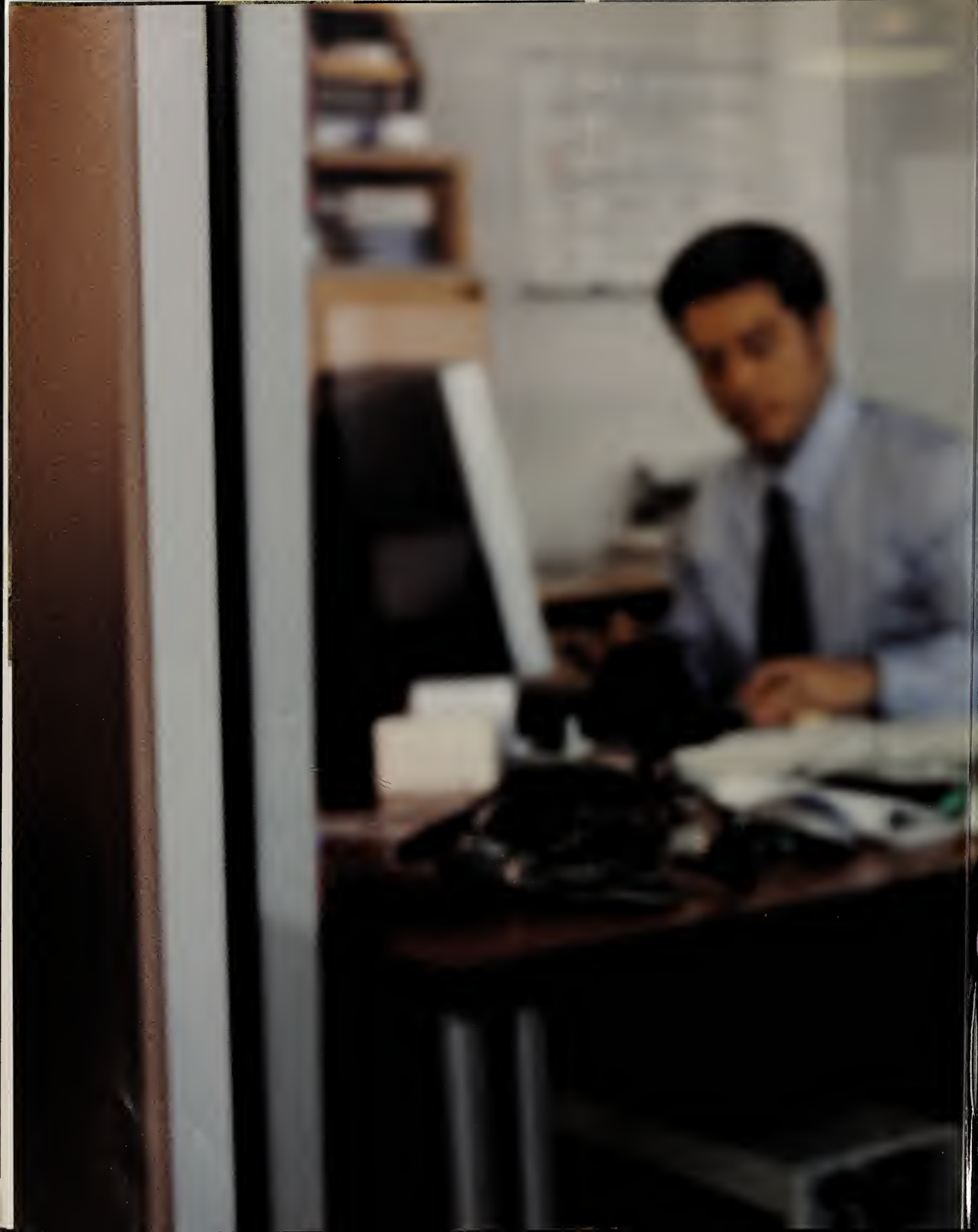

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Microsoft

Who Roots for Goliath?

Taking potshots at Microsoft has been great sport—and a great distraction—but .Net may spell the end of that game

Wilt Chamberlain, the late, great basketballer, was a voluble, quotable guy. Regrettably, his best remembered boast may well be from his 1991 autobiography, *A View from Above*, in which he claimed to have bedded more than 20,000 women. But the Stilt's most piquant quote, the one that struck at the heart of his particular predicament as a man and a performer, was "Nobody roots for Goliath."

During his prime years, Wilt, tall, almost supernaturally strong and agile, dominated the hardcourt to an extent that's unimaginable today. He once scored 100 points in a game. In the 1961-62 season, he *averaged* more than 50 points a game.

And people hated him for it.

That, as he knew all too well, is human nature. Tear down the big guy, and maybe you won't feel so small yourself.

On the technology stage, Microsoft has long played Goliath. And for just as long, people have relished its missteps, its embarrassments, ascribing all sorts of nefarious motives to its every move.

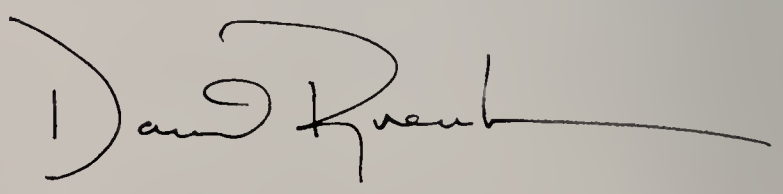
On the technology stage, Microsoft has long played the role of Goliath. And for just as long, people have relished its struggles, its missteps, its embarrassments, ascribing all sorts of nefarious motives to its every move. This is not to say that the Redmond giant hasn't made mistakes, or even that its motives have been above reproach. But inarguably Microsoft has been a convenient target, a symbol for all the vendors with whom CIOs have struggled, a convenient whipping boy for many of IT's ills.

This may be changing. In ".Net, Web Services and the End of the Vendor Era" (Page 40), Senior Editor Scott Berinato notes that CIOs who once feared that .Net was part of an evil strategy designed to eternally lock them in to Microsoft products are now applauding it as a nice, robust development framework upon which they can hang their Web services. Far from being a way to lock them in, it turns out that .Net "fosters the technology neutrality they're learning to expect."

How did this happen? After all, Windows applications never played well with other vendor apps. But as is so often the case in business, the market drove the change. And in this case, CIOs led the market. As H&R Block CIO Marc West says simply, "We're not going to use anything that's hard to run in other environments."

So what happens now? From now on, CIOs will have to focus on creating services the business can use, not architectures the business can't understand. As Berinato writes, "If CIOs don't provide value, it won't be the vendors' fault. It will be theirs."

Because, to paraphrase Dick Nixon, another complex and iconic figure from the '60s, they won't have Goliath to kick around anymore.



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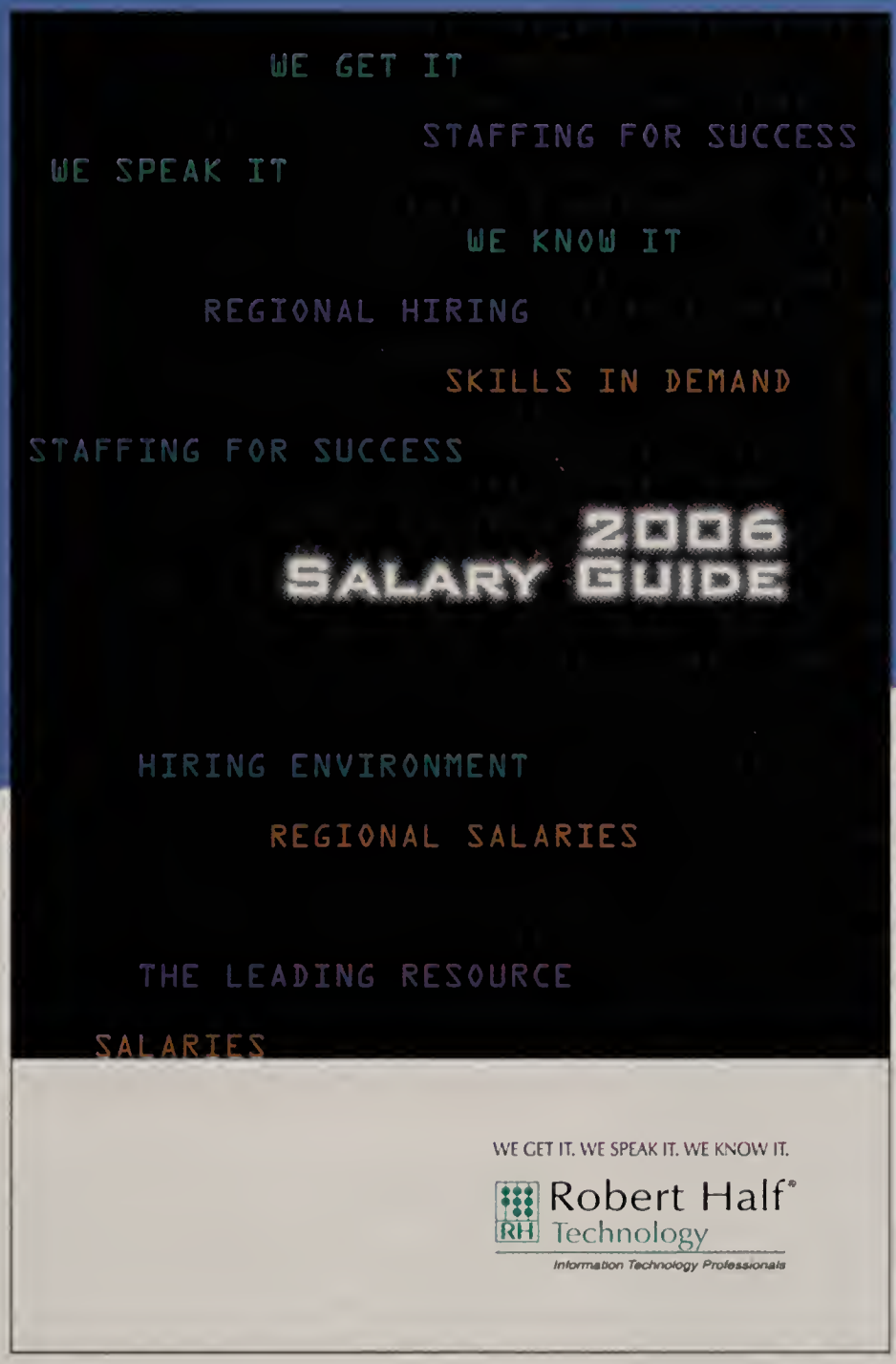

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—Scott Ohman, Manager E-Business Commercial, Cathay Pacific Airways, Ltd.

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InBox

MICHAEL HAMMER ON WHY I.T. NEEDS AN EXTREME MAKEOVER
CIO
THE PERFECT ORDER
Supply Chains With
No Delays » No Inventory » No Waste
No Problems
BY HANNAH PATTON
GRID COMPUTING HELD HOSTAGE
Why vendors aren't building grid applications
I.T. TURNAROUND RULES
Six tips for when things need to change—fast

Keep an Eye on Risk

I loved "The Perfect Order" [Aug. 1] because it focuses on the role of the CIO as an agent to reduce uncertainty through information management and realize business value, which otherwise would have been lost. However, companies oriented to the achievement of "perfect orders" would be well advised that while they are restructuring their supply chain processes, they should do so within the overall context of business risk mitigation.

A 1 percent increase in profits looks great, but not if it exposes an organization to, say, a 10 percent increase in unmitigated risk. Broad-basing your supplier base is great for achieving perfect orders, but if it enhances access to critical corporate information and intellectual assets including data, it can leave the company vulnerable to unmitigated business risk.

Wal-Mart has thousands of suppliers. But if Wal-Mart gave its supplier base access to its internal data, intellectual capital and systems to achieve perfect orders, without holding them accountable to a comprehensive standard for information security governance, then it renders the company vulnerable to unmitigated and pervasive waves of business risk cascading through its supply chain.

Risks related to abuse or even inappropriate use of information and intellectual assets, if not addressed, could lead to loss of credibility for a company, at best. At worst, it could lose market share or even shareholder value and confidence.

The question CIOs need to ask is, "How can my company most effectively mitigate the business risk associated in implementing a system for perfect orders?"

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Turnaround CIOs Share More Rules

Having been a turnaround CIO for a law firm, a manufacturing firm and a consulting firm, I've found that the first thing you should do is go back to the basics ["Rules of the Road for Turnaround CIOs," Aug. 1].

Just like a losing basketball team goes back to the basics of the game to sharpen the fundamentals, so must IT. What does IT really do? (the basics of shooting, moving and communication); how does it score? (alignment of goals with the business); what puts fans in the seats? (revenue). Get those aligned first, and the rest comes easy.

The law firm at which I was director of IT saved $300,000 within the first 90 days of my employment by renegotiating with all its vendors, consolidating servers and focusing on the basic IT skills.

A turnaround CIO is the greatest job in the world. You feel alive and with a purpose every day.

RAY MORGAN
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Speaking from experience, it's a lot easier to make radical changes when everyone agrees that things are badly broken. It's much more difficult to make the type of "rock the boat" changes described in the article when the CEO, CFO and IT staff are content. Personally, I start to get nervous when things seem to be running too smoothly—it makes me want to shake things up. However, I don't want to force change simply for change's sake.

To me, understanding when, where and how hard to push is the most important talent any CIO can possess. In IT, failure is not an option, and pushing the wrong people too hard at the wrong time can result in big-time failure.

DAVID REID
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I'm writing in response to the sidebar accompanying the story on turnaround CIOs, titled, "Do You Have What It Takes?" [Aug. 1]. One of the key aspects of a successful IT organization turnaround is recognizing that things will

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GREGORY SMITH, VICE PRESIDENT AND CIO, INFORMATION TECHNOLOGY
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move more quickly if the CIO empowers, supports and lets loose the people in the organization who want to implement successful change.

Before that can happen, the CIO has to be able to admit—and this does not happen enough—that he or she cannot do it alone and cannot be the single point of failure. If everything has to come through you, the organization will fail because of you.

Once the CIO truly commits to the organization, he or she becomes an instrument for not just departmental change but, quite possibly, cultural change throughout the entire organization.

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IT Is All About Connectivity

I see Michael Hammer is still pumping out the same old, same old ["CIO Evolution," Aug. 1]. His shtick got tiresome in the '80s, and it's even drearier now.

The point of IT is not "process"—a silly, overused word if ever there was one. The point of IT is connectivity. The entire world has shrunk to the size of a computer screen, with billions of people and trillions of ideas being combined into one glorious supernova of creative and analytical energy.

We are entering into a worldwide cultural renaissance infinitely larger than any that has come before, and all Hammer can do is drool over his to-do list, as if getting organized—which is all "process" really means—is going to hold the barbarians at bay. How deeply sad for him...but the rest of us don't have to share his folly.

This is the age of messiness. Get used to it.

JOHN GREGOR
johngregor@hotmail.com

Playing Catch-Up in Education

Publisher Gary Beach's Aug. 15 column, "Needed: Good Writers," was right on target. The only comment I would add is that there's a need to improve verbal communication through the proper use of the English language. Slang has replaced the appropriate use of English in the business environment.

You would think that with the growth of blogging that writing skills may actually improve. Apparently not.

As Beach points out, written skills are fading quickly, and I wonder if the world of electronic media hasn't encouraged the decline in one's ability to write. Like verbal slang, instant messaging and e-mail may provoke one to ignore good writing skills in an effort to save time by just hacking out communication. You would think that with the growth of blogging that writing skills may actually improve.

Apparently not.

Continuation of this trend will only place the United States behind other countries in intellectual leadership. Oddly enough, the effort required to correct the problem may be minimal. However, unless there are serious career consequences, the lack of good writing skills will likely continue.

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After having two children go through the public school system and seeing the state of math education, I'm very alarmed.

The way higher math is being taught today focuses more on how many kids we can put through accelerated classes instead of how many are really getting it. Teachers don't grade homework anymore—they just check off if you do it. If a student didn't understand it, that student is on his own to figure it out.

Pick up an algebra or geometry textbook and you'll see very little step-by-step instruction on how to do the problems. Tutoring centers are swollen with children of affluent parents trying to get them the instruction they are not getting from our educational system. The other children are simply left behind, forever marked in their own minds as "one of those people who isn't good at math."

I read this week that the United States graduates about 60,000 engineers a year. China and India combined are graduating half a million. We have a great deal of catching up to do.

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Support for HR Within IT

I thoroughly enjoyed "Strategic HR Integration" [Aug. 15] and directly related to it in my current position as an IT manager. My company's culture has changed greatly over the past couple of years with clearly defined priorities and values. These initiatives are consistently talked about by the chairman all the way down to the staff level on an almost daily basis. These initiatives were the catalyst that began the integration of human resources and technology.

We talk annually with HR to identify and discuss the need to better track and integrate HR and technology. We began with clearly defined core competencies for all levels but need to more closely integrate, measure and track the progress here.

I have worked closely with HR and have found their support invaluable to the entire organization. On a manager level, integrating HR and IT makes tremendous sense and is the right way to go.

JOSEPH TURKOWSKI
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What Do You Think?

Send your thoughts and feedback to **letters@cio.com**. Letters may be edited for length or clarity. For a link to the articles mentioned, go to **www.cio.com/110105**.

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trendlines

EDITED BY ELANA VARON

NEW * HOT * UNEXPECTED

A convoy of Wal-Mart trucks pauses on its way to New Orleans following Hurricane Katrina. The company delivered relief supplies faster than the federal government was able to.

How Wal-Mart Beat Feds to New Orleans

SUPPLY CHAIN The hurricanes that flattened the Gulf Coast in August and September tested corporate logistics and supply chain operations, as companies struggled to move relief supplies and inventory to and from the region before and after each storm. One lesson from these storms is that having procedures for communicating quickly about what needs to be done is as essential for companies as having integrated inventory and logistics systems.

"Resilient companies communicate obsessively," says Yossi Sheffi, director of the MIT Center for Transportation and Logistics.

Wal-Mart, for example, was able to move food, water, generators and other goods to areas hit by hurricanes Katrina and Rita following each storm because it has an emergency operations center that is staffed every day around the clock by decision-makers who have access to all of the company's systems.

Under normal circumstances, a six- to 10-person staff at the center responds to everyday emergencies, such as a fire in a store or a shooting outside one. When disasters such as hurricanes threaten, the staff is joined by senior representatives from each of the company's functional areas, says Jason Jackson, Wal-Mart's director of business *Continued on Page 20*

PHOTO TOP BY NICHOLAS KAMM/AFP/GETTY IMAGES; BOTTOM BY GETTY IMAGES

Clicking, Clacking and Snooping

SECURITY The idea of snooping on keyboards has been around since the Cold War, when Soviet spies bugged typewriters in the American embassy in Moscow. Now researchers at the University of California, Berkeley, have found a way to turn the clicks and clacks of typing on a computer keyboard into a startlingly accurate transcript of what is being typed.

The researchers, including Doug Tygar, a professor of computer science, have developed software that can analyze the sounds of someone typing on a keyboard for 10 minutes and then piece together as much as 96 percent of what was typed.

The technique works because the sound of someone striking an "A" key, for example, is different from the sound of striking the "T," according to Tygar. "Think of a Conga drum. If you hit a Conga drum on different parts of the skin, it makes a different tone," he says. "There's a plate underneath the keyboard [that is] being struck in different locations."

One lesson from the study is that even randomly generated passwords are not secure. Tygar's researchers were able to guess 90 percent of the five-character passwords they generated within 20 tries.

There is one easy step that users can take to conceal what they're typing: Turn up the music. In noisy environments, it is more difficult to separate the keyboard sounds from other sounds, says Li Zhuang, one of the students who coauthored the paper.

–Robert McMillan

OUTSOURCING'S IMAGE PROBLEM

LABOR A recent Opinion Research poll leaves no question that outsourcing—particularly offshoring—suffers from an image problem. Among 1,000 Americans surveyed, 72 percent of respondents said outsourcing is "really all about corporate greed," and 25 percent associated the word *outsourcing* with job losses.

That a quarter of those surveyed made the mental leap from outsourcing to layoffs shows a level of public misunderstanding about the labor practice not previously documented, according to Jeff Resnick, Opinion Research executive VP and managing director. He observes that even though many workers whose jobs are outsourced remain employed (though on the outsourcer's payroll) when jobs are outsourced domestically, survey respondents apparently equated outsourcing with sending jobs offshore.

The poll's overall findings contain many contradictions. Most of the people surveyed thought that outsourcing is good for the world economy and bad for the United States, but only 28 percent were worried about losing their own jobs. And although 69 percent of respondents believed the public can influence a company's offshoring decisions by boycotting its products, only 49 percent said they would pay an extra 20 percent for an American-made product.

–Stephanie Overby

Outsourcing Versus the Wallet

The outsourcing of U.S. jobs is really all about corporate greed.

Agree/strongly agree **72%**

Disagree/strongly disagree **20%**

Neither agree nor disagree **7%**

Don't know **1%**

71% of Americans would pay 10% more for products made in the United States...

... but only **49%** would pay 20% more.

Wal-Mart Relief

Continued from Page 19

continuity. The center is equipped with hurricane-tracking software, and on Aug. 24, days before Katrina made landfall, company managers were already planning their response.

The emergency response team works in a large, open room that is designed with efficient communication in mind. When a district manager calls from the field to tell the operations manager in the center that he needs 10 trucks of water, the operations manager can turn to the person manning the replenishment systems. The replenishment manager then checks his supplies. "He says, 'I can get you eight [trucks] today and two tomorrow,'" says Jackson. "He then tells the logistics guy. This all takes place in a matter of seconds."

As a result, Wal-Mart trucks were distributing aid to Katrina's victims days before federal relief arrived. During a less destructive hurricane, Wal-Mart ships between 200 and 400 containers of goods for sale or relief. In the first two and a half weeks following Katrina, Wal-Mart shipped 2,500 containers to the region and delivered another 517 containers post-Rita. Wal-Mart also set up satellite links for its stores that lost phone or Internet service so that they could stay connected to headquarters; Wal-Mart stores in areas that were without power for weeks were able to keep generators in stock.

Starbucks was also able to get aid to hurricane-ravaged areas quickly. When the company got a request from the American Red Cross to donate coffee, managers at headquarters contacted the company's distributors to discuss how they could help. Starbucks determined that it could donate 30,000 pounds of coffee, 235,000 bottles of water and 44,000 pastries without affecting supplies to its retail stores. Efficient communication also helped many companies avoid losing goods in the storm. MIT's Sheffi notes that GM was able to contact its dealers in New Orleans about moving their inventory out of the city and then sent car carriers to pick up the vehicles.

Sheffi says the long-term implications of this year's hurricanes will be that companies will now pay more attention to building redundancy and flexibility into their logistics operations. Companies that can communicate quickly are well positioned to weather any storm.

–Ben Worthen

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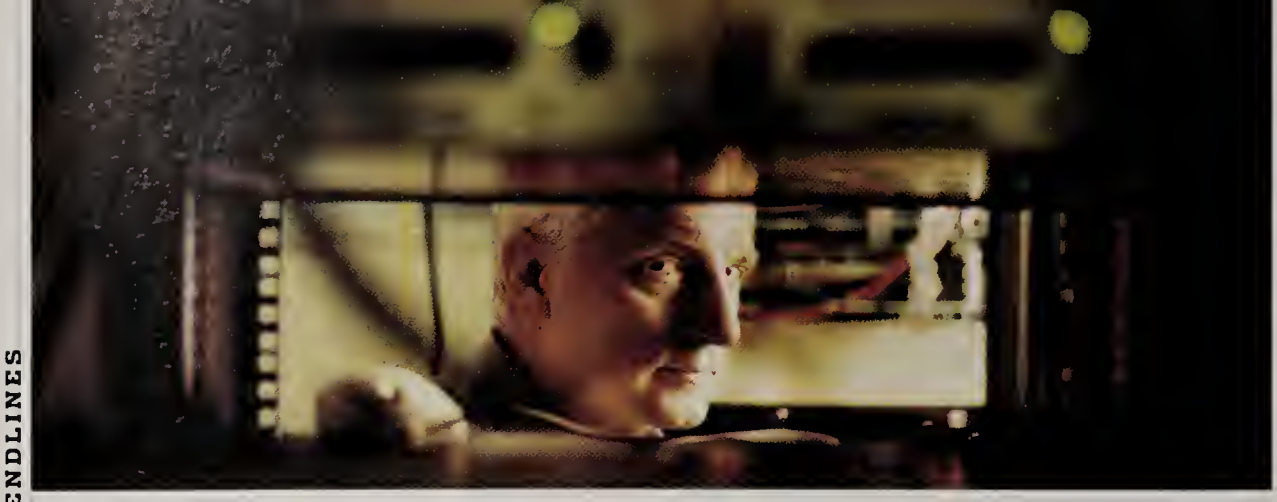

Spies in the Server Closet

FILE SHARING The Supreme Court might have stirred up a bigger problem than it settled when it ruled last June that file-sharing networks such as Grokster could be sued if their members pirated copyrighted digital music and video.

Since then, some programmers have announced they would pursue so-called darknets. These private, invitation-only networks can be invisible to even state-of-the-art sleuthing. And although they're attractive as a way to get around the entertainment industry's zeal in prosecuting digital piracy, they could also create a new channel for corporate espionage, says Eric Cole, chief scientist for Lockheed Martin Information Technology.

Cole defines a darknet as a group of individuals who have a covert, dispersed communication channel. While file-sharing networks such as Grokster and even VPNs use public networks to exchange information, with a darknet, he says, "you don't know it's there in the first place."

All an employee has to do to set one up is install file-sharing software written for darknets and invite someone on the outside to join, thus creating a private connection that's unlikely to be detected. "The Internet is so vast, porous and complex, it's easy to set up underground networks that are almost impossible to find and take down," says Cole.

He advises that the best—and perhaps only—defense against darknets is a combination of network security best practices (such as firewalls, intrusion detection systems and intrusion prevention systems) and keeping intellectual property under lock and key. In addition, he says, companies should enact a security policy called "least privilege," which means users are given the least amount of access they need to do their jobs. "Usually if a darknet is set up it's because an individual has too much access," Cole says. *–Michael Jackman*

A New Frontier for CIOs in Corporate Ops

ON THE MOVE It used to be that the only opportunity a successful CIO had for career growth was to become the respected CIO of a bigger company. There were few options for those who wanted to move beyond IT to another senior management role. But today, the prospects for CIOs who wish to take on broader management duties are looking brighter.

ASIFF HIRJI

JOE DETULLIO

Consider this: *CIO* counted eight IT executives who moved into operations positions this past summer alone. Among them, **Joe DeTullio**, Universal Music Group's CIO, was appointed CEO of Royalty Services, a joint venture of Universal Music Group, Warner Music Group, Lightspeed Venture Partners and Exigen Group. And **Asiff Hirji** was promoted from CIO of Ameritrade to COO.

Others who moved up the ladder recently include **Michael Rumak**, CIO of the Enesco Group, who was put in charge of operations in a cost-cutting move; **Lance Reese**, who after more than a decade as CIO of satellite TV company RS&I, became COO of documentation technology provider DocuTech; and **Joseph Seibert**, formerly senior VP and CIO of GSI Commerce, who joined online retailer Home Decor Products as its COO.

In addition, **Ted Cahall** left his post as CIO and senior VP of engineering at CNET Networks to take on the dual role of executive VP and COO at Classmates.com and executive VP of parent company United Online's Web Services division; **Mark Cameron** was promoted from CIO to COO at VantageMed; and **Sandra Morris**, once Intel's CIO, was hired as VP and general manager of Kodak's Digital Imaging Services Group.

Eric Sigurdson, who leads Russell Reynolds' Information Officers Practice, thinks the trend indicates that "the really outstanding CIOs have gotten so strong that companies are having to consider promoting them," either to retain them or to lure them away to new organizations. The CIOs who are best positioned to move into operations, adds Sigurdson, are those who already have several years of general management experience under their belts in addition to running IT.

–Meridith Levinson

On the Web

Read Meridith Levinson's **MOVERS AND SHAKERS** blog for the latest moves. Find it at **www.cio.com/blogs**.

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A WAY TO MAKE COMPUTERS THINK

MANUFACTURING Computers can't think for themselves; humans need to tell them exactly what to do and when. In a bid to help systems—especially manufacturing systems—work more autonomously, the National Institute of Standards and Technology has released new process specification language (PSL) software that allows users to more precisely define a business process.

"PSL lets you express, using precise and powerful means, exactly what you intend when you are talking about sequences of activities that relate to each other in a specific way," says Steven R. Ray, chief of NIST's Manufacturing Systems Integration Division.

Conrad Bock, a senior computer scientist at NIST, says PSL helps users ensure that business processes are following not only stated business rules but implied rules as well. It will, for example, allow scheduling and planning applications to talk to each other and determine how to execute a process or a step before beginning it. In real-world terms, this means, for example, that a manufacturing tool will have the ability to know that it must wait for paint to dry before placing an item in a packing box and to interpret what the word *dry* means.

Ray is working with software developers to take PSL out of the lab and integrate it with applications. One company, CAPI, has developed a prototype of a tool to help users define a set of business processes and generate a PSL specification that represents those processes.

It will be several years before the CAPI tool and others like it appear in business applications. The reason: Using PSL requires a new programming infrastructure, including authoring systems, and systems that can check applications for consistency and syntactic integrity. But stay tuned. "We see this as a standard with real promise," says Ray.

–Karen J. Bannan

Shop While You Blog

E-COMMERCE One of Taiwan's largest mobile telecom operators is launching a website that puts a new twist on blogging and opens the possibility for some real-world e-commerce down the road.

Taiwan's FarEasTone Telecommunications hopes its PlayBlog website will entice people into creating blogs by allowing them to create digital versions of themselves that can try on clothes and buy furniture. If users like what they see, they may eventually be able to buy the real thing.

Opening a blog account on the site is free. Users can assume a fictional image or upload a photo that gets converted into a digital caricature of themselves. The caricature can be given different hairstyles, noses and more before it's placed on a "name card" that appears on the user's homepage. That part of the service is also free. There's a charge, however, to fit the caricature with new clothes or create a furnished apartment.

FarEasTone has created a new subsidiary, FarEasTron, to run PlayBlog. In the future, FarEasTron plans to work with fashion businesses to sell real clothing at the site, because users will have a chance to see how they look in a certain style before making purchases, says Frank Sun, a manager at the company.

Users are also invited to buy a virtual house for their blog and to add furniture—all of which would be displayed to blog visitors. Furniture sales via the Internet are another way that FarEasTron might work with businesses in the future, Sun says.

But the point of PlayBlog is to let users experience a different lifestyle in the virtual world and to have fun, he says. The company has no definite time frame in mind for when it plans to begin selling real-world articles.

–Dan Nystedt

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Thumbs Up for that Open-Source App

SOFTWARE

A university, a startup and Intel are pushing for a standard model to rate open-source software, in order to provide users with a better sense of whether the more than 100,000 open-source projects available today are fit for their particular purpose.

The Business Readiness Ratings (BRR) model (available at *www.openbrr.org*) is the brainchild of Carnegie Mellon West's Center for Open Source Investigation. Among its cosponsors are open-source testing and certification startup SpikeSource and Intel.

One way to think about the BRR model is as a service akin to Netflix, says Joaquin Ruiz, vice president of product marketing at SpikeSource. Like the online video ordering service, users and developers will rate open-source projects. BRR organizers hope to have the infrastructure available for users to submit ratings by the end of the year.

Ruiz says the model will need to be adaptable to reflect the requirements of different types of users, such as a university or a large corporation.

The organizers have defined 12 categories for assessing open-source projects, including usability, scalability, quality, performance and support. In each category, ratings will be based on a number of metrics. For instance, the quality rating metrics will include how well the software is designed, the quality of the code, the quality of the testing, and how complete and error-free each of these elements is.

Users will rate each element on a five-point scale, from one for "unacceptable" to five for "excellent." The model will weight the 12 categories according to their importance to users, and the top seven or fewer categories will be used to calculate an overall score for the project in question.

–China Martens

Watch What You Say

MANAGEMENT REPORT Communication from the top is a leading factor in employee motivation, morale and even loyalty, according to a study from consultancy Hay Group. But keeping workers informed is not something executives do well.

From its surveys of 1.2 million employees at 400 organizations, Hay Group reports that most give their companies poor marks for internal communication. The study suggests that executives promote turnover when they don't communicate clearly about where their organizations are headed.

"One of the most important predictors of employee commitment, and ultimately loyalty, is the connection between the individual and the big picture," says Mark Royal, a Hay Group senior consultant who authored the study.

Among employees surveyed, only 49 percent said they were happy with the openness and honesty of communications within their organizations, while 42 percent said their organizations did not do a good job of informing them about the state of the business. Furthermore, fewer than half of respondents said that company executives do a good job of communicating major changes or informing them of the reasons behind decisions affecting them.

Hay Group also asked employees whether they intended to stay with their current company for more than two years. Fifty-seven percent of those who answered yes also expressed confidence in the direction communicated by senior company leaders. In contrast, among employees who said they would leave within two years, only 27 percent said they were clear where their companies were headed.

Among employees who said they would leave their companies within two years, only 27% said they were clear on where their companies were headed.

Employers fared a little better when it came to explaining how they assess workers' performance. More than half of employees surveyed said they understand how their performance is judged. But in a separate survey of more than 1,200 compensation managers (conducted by Hay Group in conjunction with WorldatWork, an HR professional association), 65 percent of respondents said that half or fewer of employees understood their company's philosophy for linking pay to performance. More than two-thirds gave low marks to their companies' communications about pay.

That's a bad sign for employee commitment, Royal says. "In high-workload environments, which increasingly describes many organizations, there's pressure on companies to reward employee contributions," he says. "But this is a time when compensation budgets are tight. That's where communication is particularly critical." Good communication "takes what might seem capricious about pay decisions and makes that easier for employees to understand and perhaps easier to accept," he says.

–Edward Prewitt

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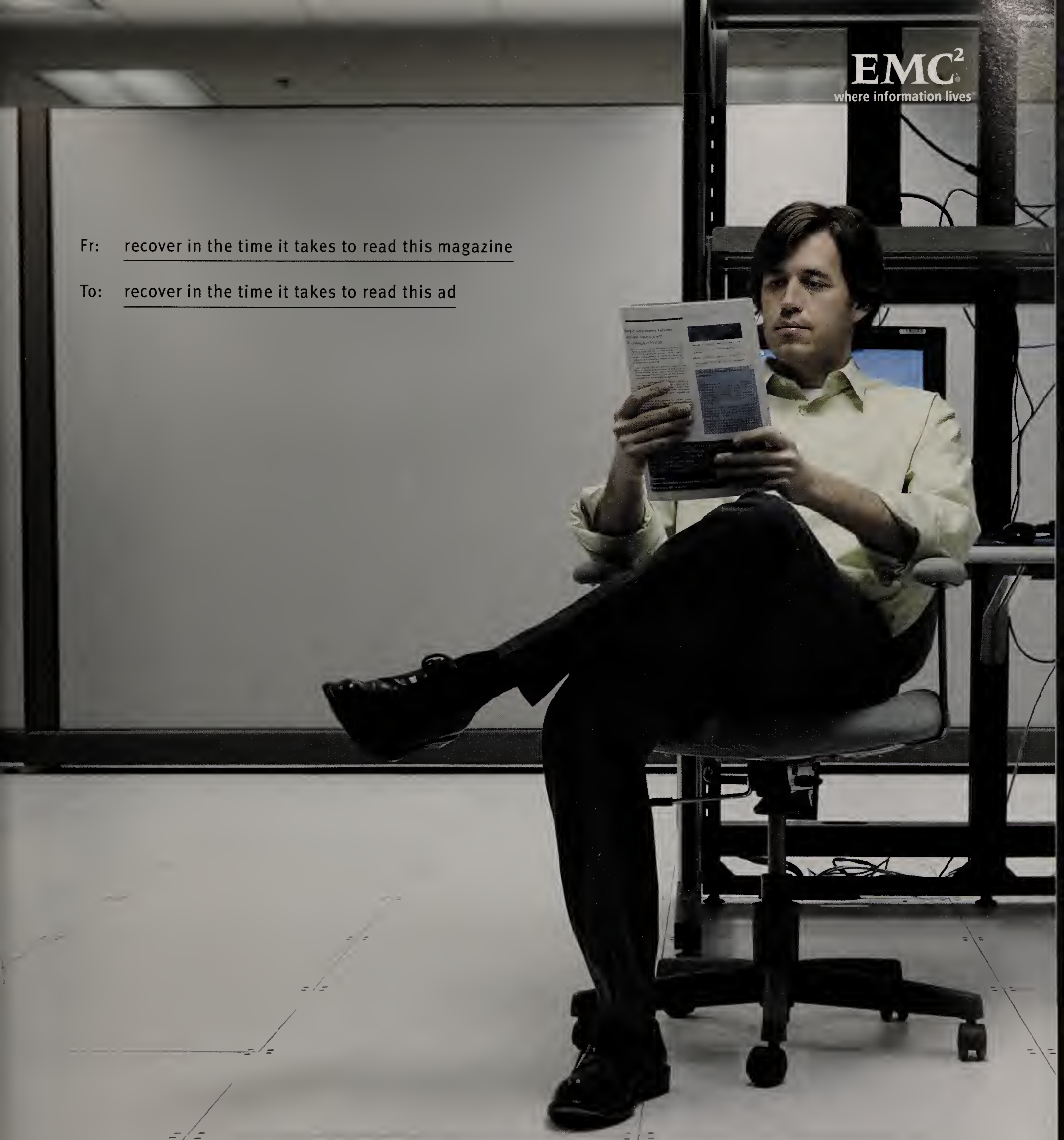
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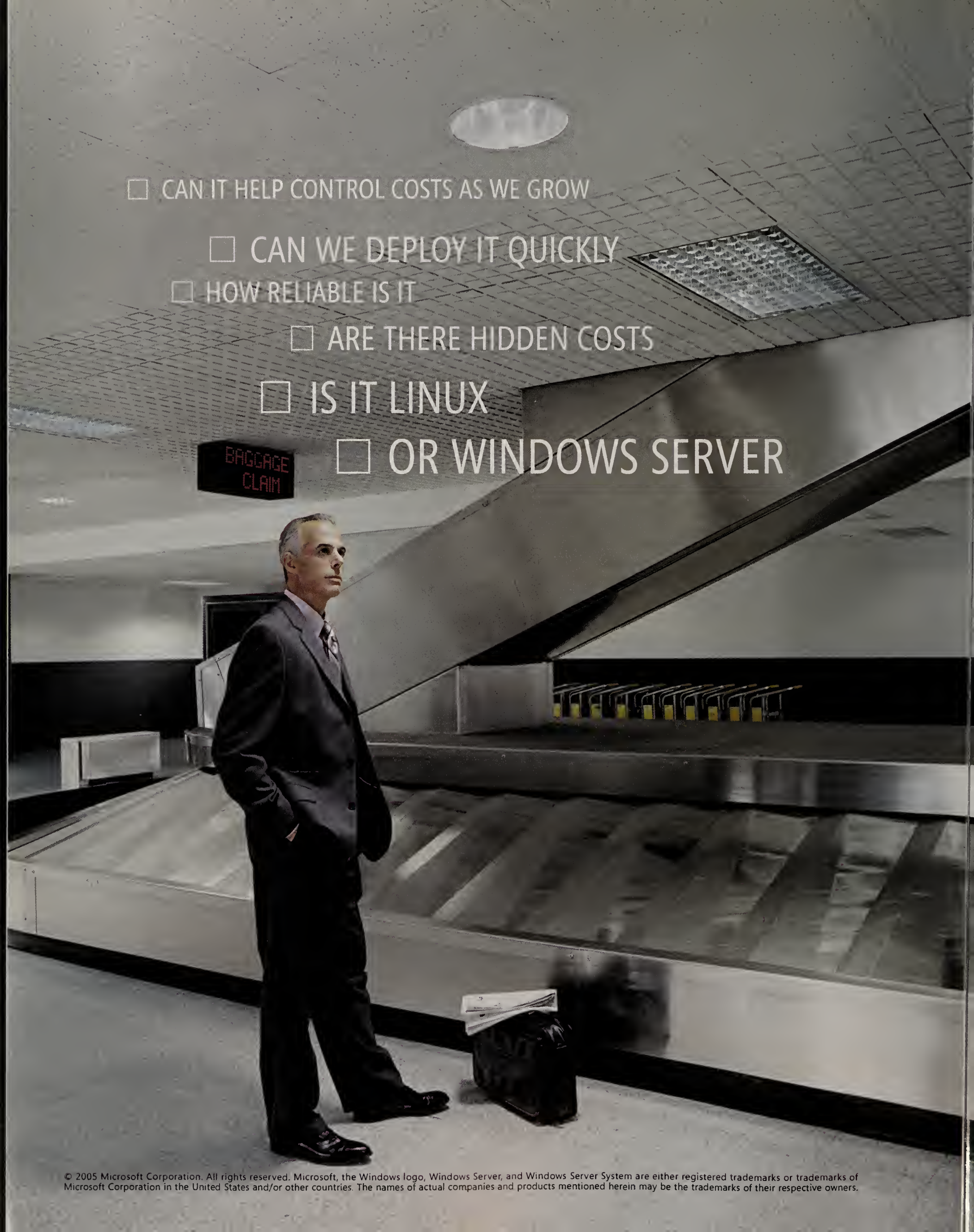
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Your To-Do List for Managing Demand

As your business clamors for more and more IT, you need a strategy for determining value

Let's convene another session of CIOs Anonymous. Ernest, a CIO at a large company, stands up and says, "My group has too much to do and we are going to fail." The audience feels his pain; Ernest sits down, at a loss for what to do.

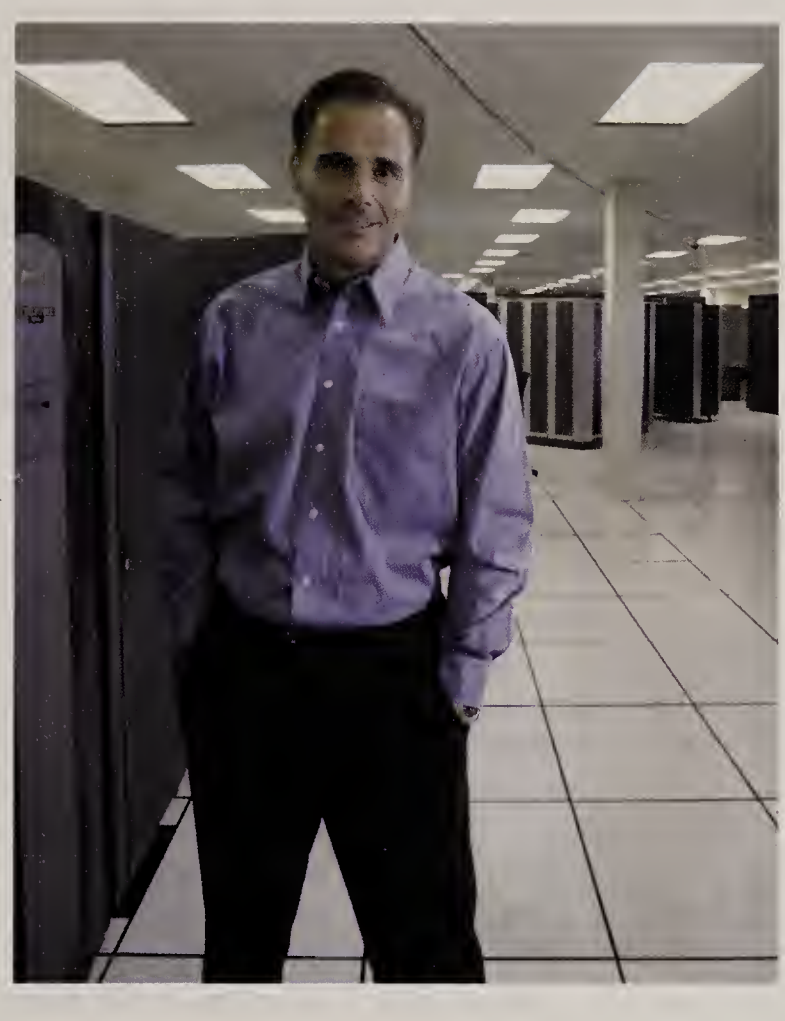
Yet Ernest is in many respects an exemplary CIO. He has improved IT-business alignment significantly by delivering on projects as promised, establishing IT councils to set priorities and increasing communication across and among the IT and business organizations. In his gut, however, Ernest knows that his success will be short-lived if he doesn't get a handle on the demand for IT services. Delivery will start to suffer, communication between the business and IT will turn negative, and the positive cycle he has worked so hard to establish will be reversed.

This article is the second in a series examining promising concepts to improve IT-business alignment. (For the rest of the series, go to *www.cio.com/110105*.) Overwhelming demand is a universal issue for CIOs, a problem for which there are no easy solutions. CIOs can establish internal mechanisms to allow IT capacity to flex with varying levels of demand and encourage business leaders to say no to their own unreasonable demands for IT services. These mechanisms help to incorporate IT into business strategy and make IT value a practical matter.

The Strategy Behind Strategy-Making

Ernest's company doesn't have a formalized strategy process. But that's not the problem. It's unlikely that any strategic plan would reflect a company's reality in a form that could be used to drive IT decision making. I support the approach outlined by Marianne Broadbent and Ellen Kitzis in their book, *The New CIO*

All Types of IT



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Leader. They recommend that strategy making be incorporated into the IT governance process by convening an IT Council for a one-day session to "shape and inform expectations for an IT-enabled enterprise."

The output of this session is in the form of business and IT maxims. Business maxims, according to the authors, identify what needs to happen if the organization is to successfully execute its strategies, and IT maxims identify how the enterprise needs to connect, share or structure information. For example, a business maxim might be that a company manage its global customers through a single point of contact. The corresponding IT maxim would be that the company have common, shared data on customers, products and financials.

Don't worry about perfecting your strategy-making process. Just make sure it includes the right people and is efficient, so that you can ensure an ongoing dialogue. In their *MIT Sloan Management Review* article, "The Real Value of Strategic Planning," Sarah Kaplan and Eric Beinhocker emphasize that the highest outcome of strategic planning is not the plan per se, but rather the learning that occurs through the process. This results in prepared minds that "have a solid understanding of the business, share a common fact base and agree on important assumptions."

The True Value of IT

Moving on to Ernest's next opportunity for improvement, his process for IT value management is form over substance—like so many of yours. Ernest's cost-benefit analyses and other justifications are filed and forgotten once a project is approved. Many CIOs profess that IT value is a critical matter, but they don't know how to make it real.

It's certainly easier to continue with the paperwork exercise. CEOs typically hold their CIOs, rather than their business executives, responsible for IT value, even though the participation of business executives is necessary for companies to truly capture IT value. What's more, many organizations don't have the financial and measurement discipline that is necessary for realizing IT value. But don't let the difficulty of the journey keep you from moving forward. Investment governance falls apart without a three-stage review of value:

- Before project approval (resulting in better investments)
- During project implementation (leading to tighter scope management)
- After project completion (providing critical learning and necessary adjustments)

IT's influence and ability to align with the business are only as strong as the link between IT investments and enterprise performance. Otherwise, IT really *is* an expense to be managed, and it will continue to come under attack from the "IT doesn't matter" types.

IT's influence is only as strong as the link between IT investments and enterprise performance. Otherwise, IT really *is* an expense to be managed.

To make value realization practical, use nonfinancial value targets—for example, operational metrics such as cycle time or service levels—to supplement or substitute for difficult-to-correlate financials. Make sure that the nonfinancial value targets are ones that are important to your organization. If your company already uses a Balanced Scorecard, you can draw the targets directly from that. Otherwise you can derive them by asking your business counterparts how they define success.

With his value targets in hand, Ernest can then set up organizational mechanisms to handle IT demand. Project sponsors (from both business and IT) should

- Include the value targets in the project justification statement
- Perform baseline measurements at the beginning of the project
- Design the project approach to incorporate and influence the value targets (for more information, see the benefits chain concept in *The Information Paradox* by John Thorp)
- Screen requests to change the project scope based on the changes' impact on the targets
- Repeat the measurement process after implementation
- Understand the reasons for any shortfalls in the value goals and figure out what actions are necessary to close the gaps

Once these process changes are in place, your IT Council will learn over time to link value commitments to IT project approval—and to tie value realization to individual and organizational performance management.

With a focused strategy process in place and the establishment of business accountability for IT value, Ernest will be better positioned to handle the challenge of IT demand. Yet that's hardly everything he must do to be a successful CIO. His ability to deliver new IT-enabled capabilities is hampered by the fact that 70 percent of his costs consist of nondiscretionary expenses, and he has an installed infrastructure that puts roadblocks in front of each project.

The next article in this series on IT-business alignment will transition from demand management to supply management. We'll explore the use of actionable pricing and agile technology to help manage IT consumption and ensure adequate IT capacity. CIO

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PHOTO BY ASA MATHAT

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Mark Goulston CAREER COUNSEL

How to Avoid Bumping Heads

IT and business executives seem to hail from two alien tribes. Here's how they can come to see eye-to-eye.

ILLUSTRATION BY ROBERT NEUBECKER

Do this, do that, get it done now, and I don't want to hear any excuses."

Ever hear these words—explicitly or implicitly—from your CEO or another CXO demanding that you either fix or implement something? They think it's just a matter of turning a switch, but here you are on the verge of a huge project, and they don't want to hear about it. This endeavor will take a drastic reshuffling of manpower, may necessitate money the CFO will resent spending and could require what they least want to give you, namely their cooperation and patience.

Before you go down the road of feeling victimized (even though to a certain extent you are) and make matters much worse by acting like a victim, take a deep breath, exhale and listen carefully to what I'm about to tell you.

If you're an IT person, there are three things that are likely to be true about you: 1. You're better with things and information than you are with people (especially where confrontations are required). 2. With regard to technology, you're as focused on what needs to be done to make IT work as you are on what it might actually do for the business. 3. You're most likely male.

Now consider where many top business-side executives, especially those with marketing and sales backgrounds, come from: 1. They're better with people and information than things (Jack Welch said, "I was afraid of the Internet...because I couldn't type."). 2. With regard to technology, they're more focused on what they want IT to do than what needs to be done to make it work. 3. They're most likely male too.

What is the significance of you both being male? Men will do anything to avoid humiliation. It's the "pride" thing. (Women suffer this less because any sense of their pride is usually bludg-

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eoned by the way their children treat them every day.) Men feel humiliated when they feel incompetent and will do almost anything to prevent that sense of incompetence from being exposed in the light of day to others and to themselves.

Men's comfort zone is directly proportionate to their competence zone. The less competent they feel, the more uncomfortable. Nobody (CEO, CFO, COO or CIO) likes to be pulled out of their comfort zone, and they will fight it tooth and nail. Rather than feeling reassured by someone else's competence, men often feel out of control and at the mercy of the more competent person. This is especially true for a CEO who has mistreated a CIO and now needs his help.

Business executives resist being dragged into their area of incompetence, the world of "things." Technologists resist being dragged into their area of incompetence, the world of people (especially people in conflict). And here's the rub for many CIOs: These business executives are comfortable dealing with interpersonal conflict and confrontation (after all, their negotiation skills have helped them get where they are), whereas most CIOs feel like they're in way over their head in such settings.

Nobody likes to be pulled out of their comfort zone, and they will fight it tooth and nail.

So when a business executive demands that you get something done and get it done now, you stand transfixed like a deer in headlights. When they blast you with what they want, then stonewall you when you start to explain what you need from them (time, money and patience) to get it done, you are frustrated. No, that's too mild—you're appalled. You're infuriated.

And you don't do infuriated well. You dig in your heels to weather the storm and stop yourself from saying that angry, but oh-so-relieving career-ending retort to this S.O.B. who crossed over from respecting your dignity to abuse a long time ago and who is making his unrealistic expectations your fault if you don't meet them. If you were a hard drive, you'd crash.

So what's a mild-mannered, "just let me do the work you want me to do and get off my back" guy like you supposed to do?

How to Talk to Your CEO

Step 1: Make sure your expectations about your CEO's behavior are realistic, not just reasonable. You might reasonably expect that you will be treated with respect if your CEO (or COO or CFO) wants to motivate you. But that may not be realistic. Don't expect an impatient, over-the-top CEO to not act that way if he's frustrated even in the least.

Step 2: Establish leverage as soon as the boss gives you an assignment. Get him to be explicit and detailed and then repeat back to him the following, "Let me make sure I get exactly what you want me to do, so I don't surprise you later on. You want me to [state here specifically what they have asked you to do] by [state the deadline] in order for you to accomplish [state the near term goal they're working on]. Now tell me once again, you envision IT helping you by providing...." This is where you should have the CEO restate what he believes the technology will provide.

Step 3: After you finish Step 2, say, "What else should I know to pass on to my people? I get the best out of them when they understand why we're doing what we're doing."

When you follow the above three steps, you accomplish several things. You empower yourself to have an exchange rather than feeling frustrated at being talked down to and doing nothing about it. You slow the CEO down and gain his (and your own) respect, which will cause him to treat you better by talking to or with you instead of over, or at, you. You cause the boss to see you as an intelligent person who can think, instead of a trained domesticated animal that just provides a function. Finally and most importantly, you will be able to take the following step.

Step 4: Say to the CEO, "If and when we run into obstacles, roadblocks and bumps in the road, and after we have come up with the best way to solve them (you don't want to worry the boss that you'll need him to solve something in his area of incompetence), the most time-effective and efficient way to apprise you of it and obtain whatever additional resources we might need is...." Here you should pause and let him fill in the blank, which you will then refer back to if and when you hit those bumps.

It's pointless to expect "reasonable" behavior from impatient top executives whose typical approach is to hit you with unrealistic expectations and then rough you up if you do anything other than comply. Rather than allowing them to run over you with a diatribe, engage them in a discussion and, if possible, a dialogue. Do this by getting them to be more explicit and specific about what they want you to do, and then say back to them what they have told you. This will let them know you listened and understood them, and that you should not be treated as if you were mindless.

Feeling a little resistant right now? It's because I'm trying to pull you out of your comfort and competence zone as someone who may prefer to avoid confrontations with your CEO (which is what the above thinly veiled four steps are). It's analogous to your trying to pull them out of their comfort zone and have them think more deeply (and realistically) of how to best use you. Just because you think you won't be able to do this doesn't mean you can't. You can and should, and you may be pleasantly surprised with your CEO's response. CIO

Mark Goulston, MD, specializes in solving business problems by applying emotional intelligence. He is the author of the just-released book, *Get Out of Your Own Way at Work and Help Others Do the Same* (Putnam 2005). You can e-mail him at *mgoulston@markgoulston.com*. Send your comments to Executive Editor Alison Bass at *abass@cio.com*.

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.Net, Web Services and the End of the Vendor Era

BY SCOTT BERINATO

When Microsoft announced .Net, Bill Gates called it a "bet the company thing." But in the process of becoming far less than Microsoft had dreamed, .Net has become much more than CIOs had hoped for and is pointing the way to a new definition of the CIO role, creating a world in which vendors—including Microsoft—matter less and less.

Reader ROI

:: What .Net really means for CIOs

:: Why Web services standards will transform the CIO's job

:: How to operationalize Web services

"Vendors have always created things to **pin us down.**"

–Rick Berk, CIO, Brown Brothers Harriman

".Net was a buzzword thing.
People just didn't understand
what it meant or what resources
were available for it."

–Brandie Fennell, CIO, Mortgage Bankers' Association of America

"The age-old IT question was,
What do we do about standardizing
on a platform? That question's not so
important with Web services."

–A.J. Sutera, director of application services, JetBlue

"I've placed some pretty big bets
on Web services; we've sold this architecture
and the promise of easier integration and
lower costs to other executives. So the applications
vendors have to play fair and keep it open."

–Tom Shelman, CIO, Northrop Grumman

"We're not going to use anything that's **hard to run**
in other environments." –Marc West, CIO, H&R Block

".Net has evolved
to the point where it's useful,
and it's time to put it to work.
It's time for CIOs to
put points on the board."

–Rob Carter, CIO, FedEx

"The question is, **Do individual vendors matter?**
And the answer more and more is, **No, they do not."**

–Hossein Moiin, VP of technical strategy, T-Mobile International

Four years ago, CIOs worried that .Net, which Microsoft was proclaiming a revolutionary new software architecture, was just another name for lock-in. "I'm not confident that Microsoft .Net will be compliant with open standards," Brett Kottman, then the e-commerce director for Excellence in Motivation, told *CIO* magazine in 2001.

He wasn't alone. In a CIO Research Report from that year, seven out of 10 CIOs said they wouldn't adopt .Net. Just one in four said Microsoft's motivation for launching .Net was technical; almost 60 percent said the motivation was marketing.

Fast-forward to earlier this year when FedEx executive VP and CIO Rob Carter built a Web service that allows his people to print to a nearby FedEx Kinko's from inside Windows Office applications. He used .Net to build it. But here's the surprising part: On the back end, the platform it connects to is *not* Windows and, says Carter, "It's really of no consequence that it's not."

But Windows has never connected easily to anything *but* Windows. Nor, for that matter, has *any* vendor's software easily linked with anyone else's. Indeed, CIOs used to be defined by which technology architecture they bet on, and the software business used to be defined by which vendors got CIOs to bet on their stuff. As Rick Berk, the CIO of private bank Brown Brothers Harriman, puts it, "Vendors have always created things to pin us down."

So how can Carter be so casual about mixing architectures when that's always been excruciatingly complex and expensive and therefore ill-advised? What happened to lock-in? Web services standards happened. If your native tongue is .Net or J2EE, C# or Java, WebLogic or WebSphere, Windows or Linux, or anything else, all countries are starting to communicate using the lingua franca of XML and associated specs like UDDI, WSDL and SOAP. And so far, software vendors have adhered to those standards in their products, including Microsoft with .Net.

"We've gone from private interfaces to an assumption that everyone can touch the interface layer."

–Rob Carter, CIO, FedEx

After decades of holding customers captive inside the walls of proprietary software, Microsoft and its competitors are selling products such as .Net that help tear down those walls. Why?

The answer is, the market made them do it.

CIOs Made Them Do It

"They didn't really have a choice," says Brandie Fennell, CIO of the Mortgage Bankers' Association of America. "We were going in this direction anyway," asserts Marc West, CIO of H&R Block.

That direction is a product of the profound change in IT brought on by Web services. The CIO's entire solar system is tilting on its axis, away from technology and toward services. The religion of technology is giving way to the agnosticism of development. And the foundation of the IT industry is shifting from vendors to integrators and services companies. At the same time, the CIO's role is changing. Once judged by the efficiency of the technology architecture that he bet on, the CIO is now judged by the value of the services he provides to the company, to partners and to customers.

Nolan Jones, CIO of the Colorado State Department of Revenue, is using .Net, Avanade and other technologies to build the new Colorado State Titling and Registration System (CSTARS) for registering motor vehicles, but "the .Net aspect of this is just in the background," he says. "All of this is focused on business process, not tools. What's been nice is we haven't heard, 'Well, that's a system limitation, we don't do that.' It's more like, 'What's your process, how can we unify that process across counties?'"

"The real question is, Do individual vendors matter?" asks Hossein Moiin, VP of technical strategy at T-Mobile International. "And the answer more and more is, No, they do not."

For the software vendors, it's a cruel irony. In a world running on Web services standards, technology platforms are fungible commodities. Once dreaded by CIOs as Microsoft's next big lock-in strategy, .Net is now applauded by CIOs as a nice development framework that fosters the technology neutrality they're learning to expect.

The shift from technology expert to process maven will not be easy for many CIOs. If they don't provide value now, it won't be the vendors' fault. It will be theirs.

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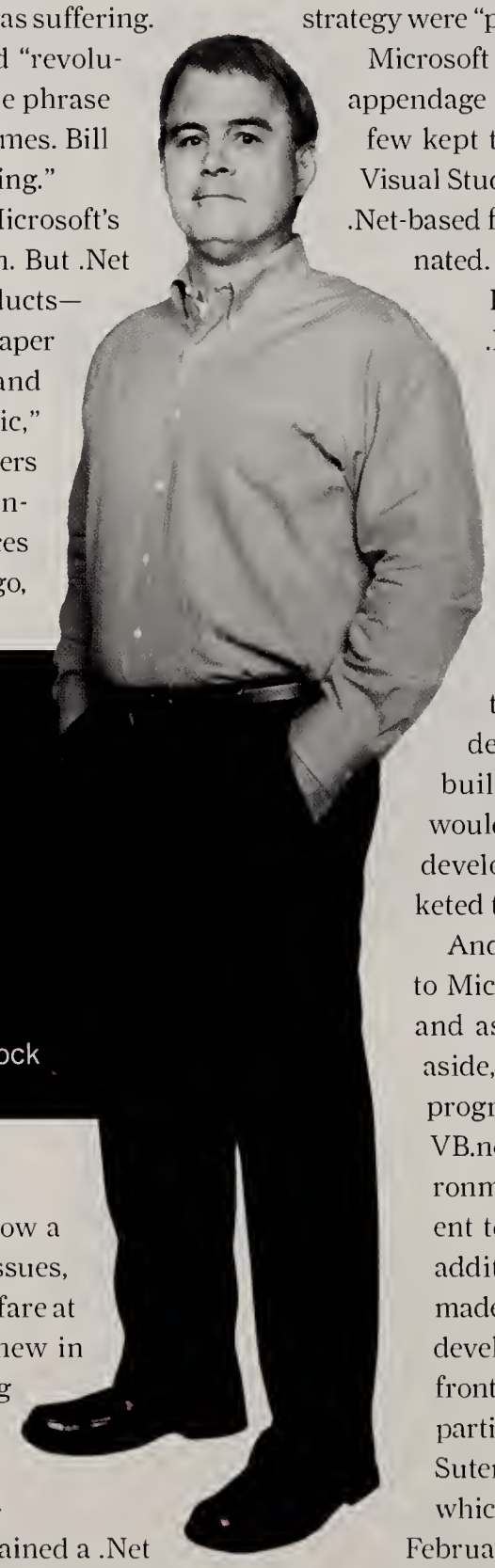
page white paper called "Microsoft .Net: Realizing the Next Generation Internet." A judge had just ordered the company split in two and, predictably, its stock price was suffering. In its white paper, Microsoft used the word "revolution" (in all its variations) nine times and the phrase "next generation" or "new generation" six times. Bill Gates said that it was a "bet the company thing."

.Net, it seemed, was supposed to brand Microsoft's software business under one umbrella term. But .Net was also supposed to be a product—or products—although what kind wasn't clear. The white paper spoke of "constellations of computers" and embedding products in an "electronic fabric," and promised "zero management" for end users and a "new era of dynamic trading relationships." The paper cited XML and Web services heavily as some of what would make .Net go, but it wasn't clear how, or to what end.



"We used to spend a lot of time on .Net versus Java. That's so much less relevant now."

–Marc West, CIO, H&R Block

Joel Spolsky, a software developer and now a frequent blogger on software development issues, summed up the attitude toward the .Net fanfare at the time: "I'm not saying there's nothing new in .Net," Spolsky wrote in 2000. "I'm saying there's *nothing there at all*."

For the next two years .Net came to describe nearly anything forged in the Redmond smithy. Microsoft's major products gained a .Net appendage: Windows Server.net, Office.net, Visual Studio.net, MSN.net, .Net Passport, .Net My Services. Vista, the company's next operating system (it was called Longhorn at the time), was advertised as something that would be built on top of several pillars of .Net—even if it wasn't due out for years.

.Net was ubiquitous.

And mystifying.

Mortgage Bankers' Fennell says that when .Net first hit, "It was a buzzword thing. People just didn't understand what it meant or what resources were available for it."

By late 2002, Microsoft was retreating. CEO Steve Ballmer conceded that "We probably made [.Net] a little harder to understand than we [should] have." Gates admitted to a "misstep" with the .Net launch, telling Wall Street that certain elements of the strategy were "premature."

Microsoft tacked the other way and lopped off the .Net appendage from many products, notably Windows. (A few kept the suffix, including the development tools Visual Studio and Visual Basic.) Eventually many of the .Net-based features promised in the Vista OS were eliminated. (Vista isn't due to ship until next year.)

In 2002, Gates offered a simpler definition of .Net: "Software to connect information, people, systems and services."

But that didn't really help; lots of software is supposed to do that.

.Net Gets Real

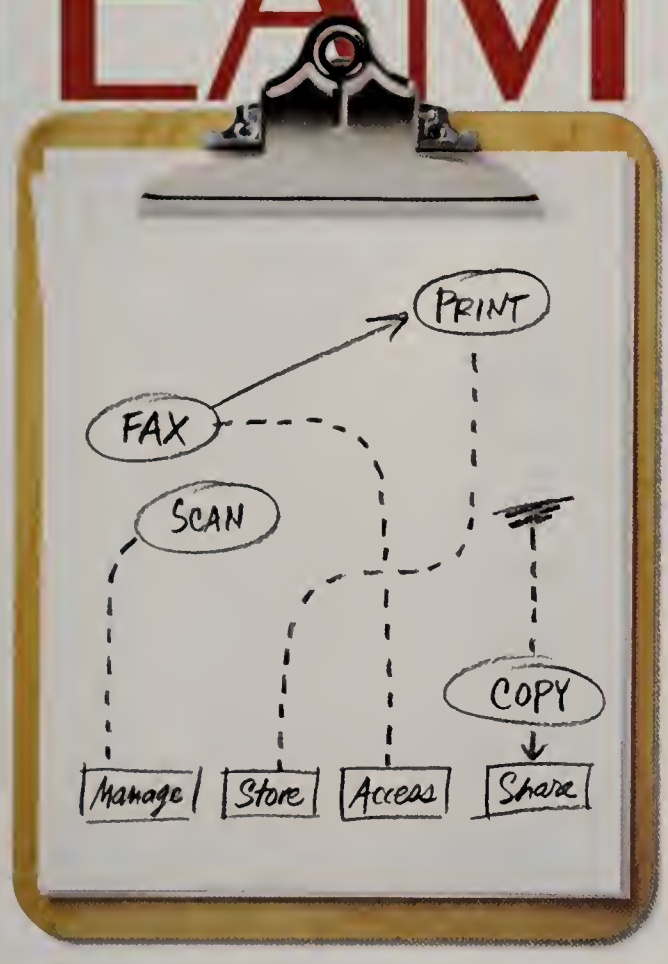
What .Net eventually came to mean (and to be) was a set of development tools and an environment or framework in which to use those tools. While .Net's marketing floundered, Microsoft's technical team was busy building those tools and the framework that would, in fact, foster a revolution in how Microsoft developers built applications. Microsoft just marketed the revolution before it had the tools.

And the new tools were turning out to be superior to Microsoft's older Win32 development platform and associated tools. Arcane technical advances aside, what Microsoft did with .Net was to allow programmers to use many languages—C++, VB, VB.net, C# and so forth—and run them in one environment, making it easier to recruit affordable talent to develop in the Windows environment. In addition, the tools were accessible in a way that made them easy to learn, accelerating training and development. CIOs give .Net high marks on other fronts too. "It really facilitates rapid development, particularly on the front-end GUI area," says A.J. Sutera, director of application services at JetBlue, which has used .Net since the airline launched in February 2000. Two reasons for this: .Net development uses automated memory management, which means developers don't have to spend time worrying about how applications grab and give back memory to the computers running the programs. And .Net allows for managed, reusable code. Processes don't have to be written every time, but rather can be grabbed from a repository and plugged into the application being built.

By 2004, standards for Web services, such as XML, SOAP, UDDI and WSDL, had been hashed out well enough (with the unlikely cooperation of Microsoft and IBM keeping the standards moving forward), and Microsoft and its competitors adopted them in their development frameworks. That helped

PHOTO BY JASON DAILEY

TEAM PLAYER



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CIOs start to take Web services more seriously. "Right now, we're seeing the advances in the technology, much more than a couple of years ago," says MCI executive vice president and CIO Elizabeth Hackenson. "We've gotten through the bad times and now we can put this stuff into our strategic plans."

The robustness of the .Net development framework allowed CIOs to ignore its marketing. "It's a development environment," says Berk of Brown Brothers Harriman. "You either develop with it or you don't. It's that simple."

Free at Last

For Microsoft, binding .Net to Web services represents a profound shift in the company's strategy. Microsoft has pried open a space between its development tools and its technology architecture. What has been created is not the technology independence that Java makes possible (you're still developing Windows applications), but Windows applications can now easily talk to other applications through the Web services layer. Rick Roy, CTO of CUNA Mutual Group, calls it a "loosely coupled application environment."

Microsoft admits that this is a big change. "Customers have existing large investments in terms of staff, hardware and software for back-end systems," says Microsoft's John Montgomery, director of the .Net Developer Product Marketing Group. "It could be an OS/390, AS/400, WebSphere, SAIP, Siebel, whatever. And the larger the company, the more likely that software is running on Big Iron. Historically, a Microsoft salesperson would have said, 'Rip all that out and put in the Microsoft technology stack.' With .Net, our intention was to overcome the either/or and get to a point where customers can choose what they want where it's appropriate, instead of having a religious conversation about the technology stack."

So, as profound as this change is for Microsoft, .Net and its link to Web services represent a more profound change for CIOs, who finally can choose the development tools that are best for the service an application will provide, rather than having to use the tools that are determined by a preselected technology architecture. Plus, the fungibility of Web services means technology risks are diminished. If one development environment doesn't work out, it can be changed, and that failure won't ripple through the entire technology architecture. CIOs can not only tolerate heterogeneity, they can embrace it, inside their companies and out, with partners and customers.

"The age-old IT question was, 'What do we do about standardizing on a platform?'" says JetBlue's Sutera. "That question's not so important with Web services. It gives you a freedom you didn't have before that is exceedingly attractive. Just use the right tool for the right job."

Microsoft Goes All In

Redmond is betting CIOs will have to connect their Web services offerings to Office and Windows—a bet Google is willing to call

By now, .Net was supposed to be the centerpiece of Redmond's empire. Yet when Microsoft met with Wall Street analysts this past summer, the company didn't focus on .Net. Instead, CEO Steve Ballmer concentrated on "anchor businesses," such as Windows and Office.

But the latest version of Windows was four years ago; the next isn't due for a year.

Microsoft is facing so much skepticism on Wall Street that in late September the company announced a huge reorganization. The reorganization is "part of driving software-based services in competition with anybody else who thinks they're going to use that strategy to get ahead in the marketplace," Ballmer said in a *Wall Street Journal* interview. "We're not the only guy who's going to try to deliver software that has a service-based component. We need to get there aggressively and quickly."

But Microsoft still has faith that your average businessperson weaned on Excel, Outlook and Word will continue to prefer those applications to anything Web-based. Windows and Office, Microsoft argues, can simply do more than a browser—better graphics, more complex applications, more immediacy than the click-and-wait world of the Web. CIOs will want to develop Web services for Windows and Office because of these "rich" features. And Microsoft is doing everything it can to encourage Web services development on top of Windows and Office, including creating a development toolset specifically for Office. One product of that would be Mendocino, an effort to use Office as a front end for SAP's ERP software.

Microsoft is betting that if you try to take Windows and Office away from users—no matter how much sense it makes financially or from a development point of view—they'll revolt. The appeal of Mendocino is that it's something everyone is comfortable with—Office—fronting something everyone is uncomfortable with, ERP. As FedEx Executive VP and CIO Rob Carter says of his decision to integrate his .Net Web service with Office, "The vast majority of the world finds the Microsoft desktop productive and standard. For people who want it, we could provide a browser interface. It just won't be the same."

But what if it became the same? Users are comfortable with browsers too. And technologies, such as Ajax, are being developed right now that make browsers quite rich, with the kind of immediate gratification and deep visual and complex transaction capabilities of a desktop application. Front and center with these kinds of Web applications is Google, Microsoft's new nemesis. (Many observers say it's this threat—Google, its applications and the fact that it keeps taking Microsoft developers away—that spurred the massive reorganization in Redmond.) Google Earth and Google Suggest, among others, are just hints at what Web-biased developers want to do with the Web: Take it out of its click-and-wait heritage and take on Microsoft. *–S.B.*

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It is a great unburdening. The weight of technology decisions—the very decisions that used to be at the core of the CIO job—have been lifted from CIOs' shoulders. Instead of thinking about the technology, they can focus on the business—what services to expose to whom, what business processes to improve. And because they don't have to match up different technologies, they don't have to spend all that time on integration.

"We can look at process instead of code," says H&R Block's West, who credits its Web services and .Net for getting his client acquisition system up and running much faster than it could have been in the old days. "We have the opportunity to do more-valuable work. We used to spend a lot of time on .Net versus Java. That's so much less relevant now."

"I couldn't care less what developers use," says Scott Osgood, CTO of Noel-Levitz, a subsidiary of Sallie Mae. "I've been freed up to worry about what we're trying to accomplish rather than technical interfaces."

At supercomputing research organization Cornell Theory Center, David Lifka, who is director of computing and information sciences, recalls a great example of how Web services provides leading-edge interoperability. "We had this collaboration with several universities; they're all rocket scientists doing materials modeling at the atomic level. But they all have their own platforms. It's a three-year grant, so we said, 'We can spend three years porting all the data to one platform, after we argue forever about which one will be best, or we use the Web services glue.' Obviously, we did the latter and it took less time and worked out great."

"It's just so completely logical that this is how we should develop," says Mortgage Bankers' Fennell. "It's surprising we haven't always done it this way. Then again, we didn't have the tools from the vendors."

Catch the Conversation

Joel Spolsky has been called one of today's most influential developers and authors. Although he called .Net "nothing" back in 2000, he's got lots more to say about it now. Listen in and find the link to his blog at **www.cio.com/podcasts**.

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Some Things Never Change

As CIOs start to put .Net and WebSphere (its archcompetitor from IBM) to work for Web services, the old question of which technology architecture do you subscribe to may be gone, but there's a new question: Which tools are appropriate where?

Despite the fact that IBM and Microsoft have played nice on standards, they're still sniping when it comes to marketing their particular tools to CIOs. But what's interesting about this competition for CIOs' attention is that, for the most part, CIOs aren't paying much attention. CIOs aren't betting on either .Net or WebSphere. They're betting on Web services. .Net and WebSphere happen to be means to that end. As Lifka says, "What you really care about is that .Net supports Web services and managed code. That's what makes it attractive."

Many CIOs use both .Net and WebSphere and will continue to. There is no consensus on which tool is better. Many are choosing to operate with Microsoft on the client side and IBM technology in the back office; old habits are hard to break. But standards have made allegiance to any one vendor out of date, says Bob Laird, chief IT architect at MCI. "Look, if one person's cement deteriorates, or can't hold up, we can always put the other person's cement in."

The Importance of Standards

With Web services, CIOs have a common language for easier integration, the capability to expose their companies and others to a whole new range of services, and less risk in choosing technology at the outset of projects. Vendors have to compete on merit, not by virtue of lock-in. It sounds like the dawn of a golden age for CIOs.

"When vendors start getting outside the standards, they start putting CIOs like me at risk." –Tom Shelman, Northrop Grumman CIO

But there are risks. If vendors don't adhere to standards, CIOs could end up where they started, having to do tricky and expensive integrations of proprietary technologies—and dealing with angry businesspeople wondering what happened. "Keeping to standards overshadows everything else," says Northrop Grumman vice president and CIO Tom Shelman. "Like many CIOs, I've placed some pretty big bets [on Web services]; we've sold this architecture and the promise of easier integration and lower

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costs to other executives. So the applications vendors have to play fair and keep it open. When they start getting outside the standards, they start putting CIOs like me at risk." As commodity development allows Web services to take off, standards must be honed and further developed, and companies building Web services need to discipline themselves to adhere to the standards while pressuring vendors to do the same.

To date, the MAD (mutually assured destruction) theory has held standards together. As West at H&R Block says, "We're not going to use anything that's hard to run in other environments." In other words, if a vendor doesn't hew to standards, West will walk away.

Meet the New CIO

No longer technology czars, CIOs need to be business experts who understand services. When decisions are dictated by the technology architecture, it's limiting but it's also a crutch. The limitations of the technology could explain a lot away. In a Web services world, the CIO carries the weight.

A new job in a new landscape means different challenges, not fewer. Shadman Zafar, Verizon's VP of architecture and e-services, argues that the CIO's new central mission is simple: Operationalize Web services.

models of cars on a single platform, using shared components. At the time, the changeover required a huge investment in time, money and training in order to realize the savings that were deferred by the initial investment, says Goldsmith. But today those savings are beginning to be realized.

"The complexity of the governance problem that you have to deal with in a services-oriented environment is big," says Keith Glennan, Northrop Grumman's CTO. "The CIO has to sink time and money into planning and operation," says Zafar. Otherwise, he says, Web services is just a bunch of "toys" and "tricks"—little pieces of code that do neat things but that can't help the business in any meaningful way. Without operationalization, Zafar says, "Web services is just a little bit of magic—and magic runs out."

A Different Revolution

Microsoft announced a revolution in 2000 and said .Net was it—the biggest change to computing since the Internet. But as it turned out, .Net was the result of a revolution, not the cause of it. What brought .Net to its current status—a solid set of development tools among several solid sets of development tools—were forces outside of Microsoft's control: CIOs' need to rein in out-of-control, heterogeneous environments in a low-cost way, the development of XML outside of any vendor's

Without planning, "Web services is just a little bit of magic—and magic runs out."

–Shadman Zafar, Verizon VP

By that, he means create an SLA-like model for the Web services that programmers develop. It has to be clear to anyone who might want to develop or use a Web service how it can scale, what its level of security is and so forth. And if others want to use that service, the group that developed it needs to be compensated for its work. If anything, Zafar says, a vendor such as Microsoft with .Net should focus on helping CIOs manage the tools and services rather than focus on the tools themselves.

Zafar has operationalized his development with "IT Workbench," a formal and standard procedure for application development. "As soon as you start a project, you go and search for parts, for code already developed [which is stored in a taxonomic, searchable repository] that can help, and you'll know what that code is capable of. You get what you can use and develop the rest"—in .Net, WebSphere, whatever is most appropriate—"and then all of it is thrown back on the shelf for others to use."

This takes time and money to get up and running. Web services is no free ride. Ian Goldsmith of SOA Software, which works with Verizon, compares the current environment to the challenges faced by auto manufacturers in the 1990s when they began revamping their assembly lines to build several

purview, the development of Web services standards as a reaction to the development of XML. The Internet.

"To me, the revolution occurred 10 years ago, when transactions moved to the Internet," FedEx's Carter says. "If you look back, just 10 years ago, everything we did to connect mainframes, and Unix and Windows and VAXes, was proprietary network linkage. How we reached out to customers was with dedicated lines, dial-in services, SNA and DecNet and TTY dial-up, terminal emulation. In a mere decade, we've gone from all these expensive and private custom interfaces to an assumption that everyone can touch the interface layer. And now we've got this services orientation that lets us touch that interface layer in a much easier way still. It's making computing very horizontal. It's profound."

Carter gives credit to Microsoft for making .Net real. ".Net launched with a flourish and a lot of fanfare before there was a 'there' there," he says. "Now it's evolved to the point where it's useful, and it's time to put it to work.

"It's time to put points on the board." CIO

Senior Editor Scott Berinato can be reached at *sberinato@cio.com*.

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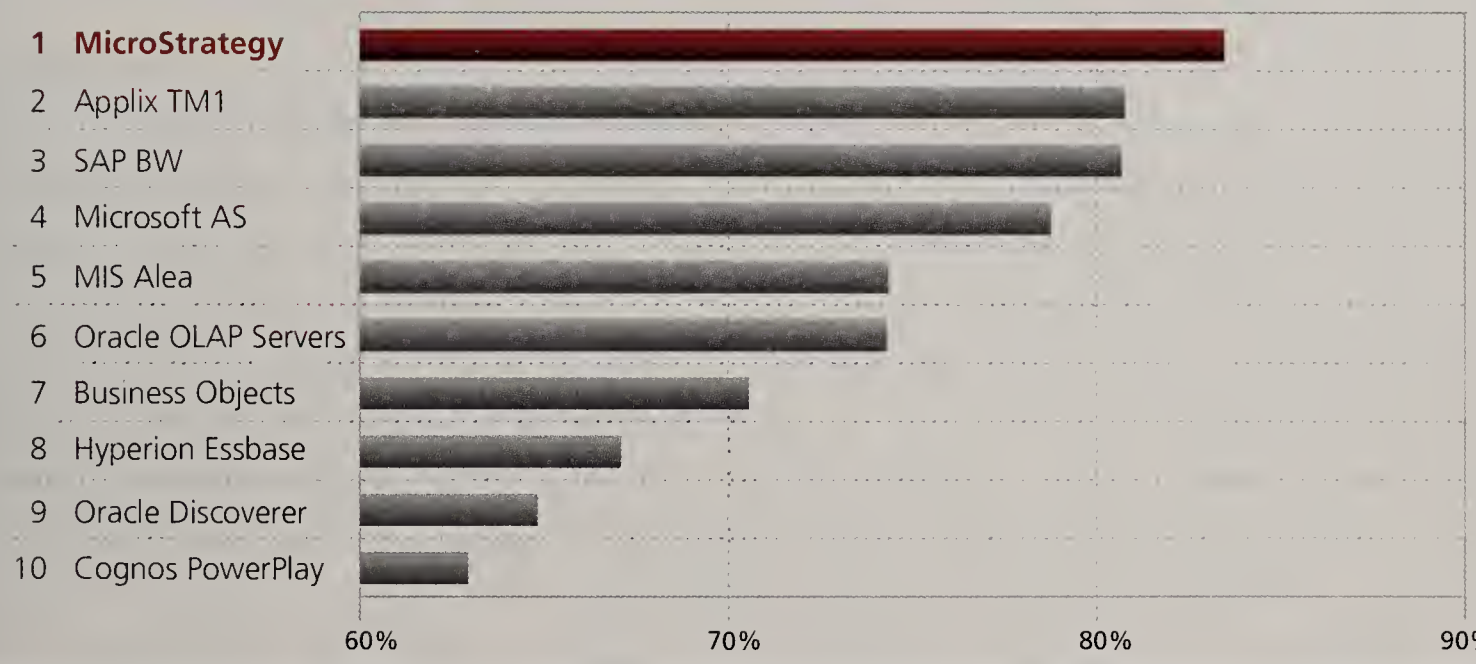

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Are You Ready for Web Services?

BY CHRISTOPHER LINDQUIST

Thousands of companies

use Web services every day, but thousands more have yet to take the plunge. How well is your company positioned to benefit from Web services? To find out, take this quiz to assess your own Web services readiness quotient. Answer each question honestly, checking all answers that apply. (Some questions may have more than one answer.) If no answers apply, skip the question. When you finish, tally your score to see where you stand. Then turn to ".Net, Web Services and the End of the Vendor Era" on Page 40 to find out more about the Web services development landscape.

PHOTO BY GETTY IMAGES

Continued on Page 54 »

IP Telephony

An Innovative Route to Optimization

Utility Model Offers Key to Low Capital Costs and Low Risk

In a climate where optimization is "job one," according to analysts, the IP telephony revolution (based on the voice over Internet protocol, or VoIP) sweeping North American business truly has legs and is gaining momentum. According to Scottsdale, Ariz.-based In-Stat, server-based IP PBX shipments will represent more than 91 percent of total PBX shipments by 2009! But many organizations are justifiably concerned about the transition costs, risks and the changes IP telephony may portend for their IT and telecom organizations. While the changes are inevitable, and the rewards worthwhile, getting there doesn't have to be painful. There are alternatives to the "big bang" and do-it-yourself models. More flexible approaches are now available and allow organizations to choose the optimal balance between capital and operational spending while making the

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most of existing infrastructure. Many companies are choosing to optimize investments by leveraging IP telephony as a utility. With a utility model approach, the provider owns and manages the infrastructure while the enterprise pays a fixed monthly charge for each phone. Equant, a leader in worldwide business communications, believes this approach offers tremendous opportunities to cut capital costs and improve utilization of people and infrastructure.

IP telephony, based on VoIP, is no longer an emerging technology and has moved solidly into a period of rapid and accelerating business adoption. "Much of the recent excitement over VoIP has focused upon relatively minor deployments to the consumer market," says William Stofega, senior research analyst, VoIP services at IDC in Framingham, Mass. However, IDC says that the bigger story is that the business market is ripe for adoption of VoIP and the features and functionalities that it promises. In-Stat says that between now and 2009, server-based IP PBX shipments will grow from 9.5 million lines to 28.1 million, at which point such systems will represent over 91 percent of total PBX shipments.

It is clear that "the IP PBX is revealing itself as more than a simple one-for-one replacement vehicle for digital systems," according to a statement by Norm Bogen, an In-Stat analyst. Furthermore, he notes, "With closer ties to data, this new vehicle is influencing corporate power structures and will ultimately have even more far-reaching effects on how business is done around the globe." Indeed, it is those closer linkages with data and the opportunity to share elements of IT infrastructure—"influencing the corporate power structures," in Bogen's words—that make VoIP a primary vector for optimization. But the greater benefit is IP telephony's effect on how business is done. In addition, IP telephony is oriented to the future and emerging capabilities, such as multimedia instant messaging and multimedia collaboration.

Consider the experience of a leading global ocean transportation company that has adopted Equant's industry-leading multiprotocol label switching (MPLS) based IP VPN network. The system now provides a flexible communications infrastructure that includes IP telephony. Equant customized an IP solution for the company that can support all traffic, from voice to video to data, by providing different levels of prioritization to applications traversing the network based on their performance requirements and criticality.

Not only are organizations able to cut their capital expenditures and streamline their structure, by taking the utility path they are able to deliver better service with more features.

Consider, too, the benefits of IP and the ability to provide services from anywhere to anywhere. Suddenly, the same benefits that data center consolidation brought to data applications also apply to voice and multimedia applications. So customers can centralize their voice services while providing those services to everyone in the corporation. As voice services evolve, enterprises can upgrade them centrally and all users can get the benefit of those applications.

The ability to create this kind of flexible communications solution in tune with specific corporate needs is a key benefit of the technology. Not only do organizations reduce their total cost of ownership for providing voice, they also prepare for the future services that IP telephony will enable. Companies also achieve cost savings and efficiency gains from running data and voice over the same converged network.

But even with all its advantages, IP telephony does not come free. Most obviously, there can be significant capital expenditure spikes required to purchase hardware and software assets and fund the write-off of existing equipment. Then there are the questions of who will own and manage the new system and what staffing will be needed to keep it up and running. The challenges posed by these financial and organizational questions have sometimes put a brake on IP telephony adoption for many mid-size firms or divisions of larger organizations. But these challenges can be overcome.

THE LOGIC OF THE UTILITY MODEL

Particularly when seen in the context of the overarching pressure to optimize infrastructure, IP telephony makes the greatest sense when considered not simply as a purchasing decision (which, as noted, can have large impacts on capital budgets), but as an opportunity to rethink the way telephony is managed and delivered. For instance, the utility model offers simplified and appealing pricing typically based on a per-phone/per-month utilization.

In other words, IP telephony is already a disruptive

technology, so it makes sense to leverage the technology transition as an opportunity to rethink the business side of your telephony equation and consider fresh approaches.

Questions to ask include:

• Must the modes of operations that have existed since the establishment of the earliest private branch exchanges be retained today?

• Are there better ways to deploy people and use their talents?

• How much of the technology must be purchased and managed, and how much can be provided and handled by others?

Such questions lead a growing number of organizations to embrace a new approach to telephony—implementing IP telephony as a utility. Although an unfamiliar path for some, the utility approach allows organizations to choose the optimal balance between capital and operational spending, make the most of existing infrastructure (recycling as many existing investments as possible in the IP framework) and make the best organizational decisions by selecting what to buy, what to lease and what to manage.

Embracing the utility model is an approach that offers the maximum flexibility for the future, retains key legacy elements and delivers the best value in the here and now. Not only are organizations able to cut their capital expenditures and streamline their structure, by taking the utility path they are able to deliver better service with more features to their end-users. "When you look at the whole picture and examine the opportunities to do more with less, the IP telephony utility model can be very appealing," says Lee Cardona, Equant Solution Consultant.

PARTNERING WITH EQUANT

As a recognized leader in global communications services for multinational businesses, Equant combines network expertise with its expanded services capabilities to provide global, integrated and customized communications services—including the market-leading IP VPN used by nearly 1,300 global businesses. Equant has harnessed its resources to help customers achieve more by delivering communications services that include data and IP networks, voice, mobility and video.

"The focus isn't just on cost, it is on enabling better use of resources and enhancing performance," explains Cardona. "Working with our customers, we aim to deliver a higher level of performance, leveraging what each of us brings to the table."

IP Telephony Earns Its Stripes at Chevron Unit

When Chevron Oronite, a division of Chevron, found its telephony infrastructure becoming too expensive to maintain and operate, the company decided to head for the future rather than risk getting stuck in the past.

Chevron Oronite originally purchased its telephony services from a local supplier—a combination of analog and ISDN as well as a PBX that was already seven years old. When the supplier demanded a high fee to upgrade the PBX, Chevron Oronite decided to look into IP telephony as a possible solution. With Equant's help, the company replaced its traditional PBX infrastructure with an IP telephony solution, avoiding a large investment in a PBX system upgrade while gaining extensive benefits in functionality.

Benefits of the evolution to IP telephony included:

- equipment maintenance costs were cut in half (after allowing for a one-time write-off of the old equipment)
- many calls are now free of charge because they stay within the company's network
- due to the dynamic nature of the service, no extra bandwidth was needed for the data network to accommodate the voice traffic
- ROI was achieved in 16 months
- monthly maintenance costs were significantly reduced
- international calls now cost 20 percent less
- Chevron Oronite can implement moves, adds and changes itself, significantly reducing total cost of ownership and allowing more control

In addition, the company says it has acquired a much more flexible telephony system with an even greater reduced total cost of ownership.

Equant's IP Telephony Utility service addresses the end-to-end requirements of customers' telephone communications with IP-based technologies. It is designed to offer comprehensive voice services delivered within a flexible operational and commercial framework. With the introduction of its IP Telephony Utility service, Equant is bringing to customers a flexible framework to deliver and integrate their telephony infrastructure into a fully managed IP-based infrastructure with full and centralized cost visibility. The result is that one single network can be used to carry all the voice, video, and data traffic on an end-to-end basis joining IP phones on the desktop with LAN IP telephony and VoIP on the WAN. And by moving from a capital expenditure to an operational expenditure approach, the IP Telephony Utility service offers improved cash flow and enables better alignment of services to business requirements.

Moving telephony from a distributed, locally managed, legacy TDM-based voice system to a centralized and integrated IP-based application allows new ways of managing and integrating telephony services along with other IT applications and enables the sharing of a common secure network infrastructure. What's more, Equant offers flexibility to customers in terms of what they own and manage—it's not a one-size-fits-all approach. For example, customers can choose two basic approaches or a combination based on the following options:

Customer Managed option—Enterprises rely on Equant to provide:

- advice and expertise on the appropriate infrastructure design
- liaison and leverage with the leading IP telephony vendors to offer best-in-class products
- supply and deployment of equipment
- service desk and incident management services (remote and on-site fixing) available with the customer responsible for the day-to-day management of the systems

Fully Managed option—Enterprises rely on Equant to provide all of the operational and management aspects linked with the deployment of an IP telephony solution, such as:

- the solution and attached services through an optimized financial package (customer-owned or Equant-owned, in which the customer pays monthly, per-phone fixed fees)
- leverage with leading IP telephony vendors to offer best-in-class products
- deployment of the solution
- a fully managed solution after the implementation, with a complete service portfolio adapted to each customer's needs

The elements included in Equant's IP Telephony Utility service includes:

- *Telephony Assessment*—determining functions and access capabilities required for different users and to meet corporate objectives
- *Telephony Design*—the detailed, technical plan
- *Infrastructure Equipment*—all infrastructure equipment is purchased and owned by Equant, removing capital expenditures from the enterprise's business plan
- *Telephony Implementation Service*—full IP Phone and IP PBX features and functionality
- *VoIP VPN*—Intelligent network voice over IP VPN service for on-net (toll bypass), attractive off-net rates, global private dial plan, least cost routing and other capabilities
- *Applications*—Capabilities such as voice mail, unified messaging, conferencing, corporate directory and more
- *Telephony Management*—Full day-two support for ongoing technical collaboration
- *Monthly Fee*—based on the number and type of phones used and the features selected

Equant's IP Telephony Utility service is aligned with the growing trend in business VoIP. According to IDC, the fastest-growing VoIP market is hosted IP voice services for business customers. And, IDC notes, hosted IP voice services are fundamentally different from PBXs because capital expenditures are avoided, maintenance contracts are unnecessary and management is fully outsourced to a secure, central location. In addition, the customer is assured of instant access to the latest upgrades in both hardware and software.

"Equant's IP Telephony Utility model provides a solution to the most vexing problems facing organizations today," says Cardona. "Equant provides fast and immediate results that preserve capital, allow you to focus on your strengths and delivers leading-edge and future-oriented capabilities."

FOR MORE INFORMATION

For more information on Equant and IP Telephony Utility services, go to www.equant.com

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How Will IT Contribute to Enterprise Value in 2006?

We will explore this in depth in the Feb. 15, 2006, issue of *CIO*. You won't want to miss it!

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Questions

1. Web services is:

- ○ **a.** any Web-based application (0 points)
- ○ **b.** client-server computing by another name (0 points)
- ○ **c.** a standards-based means of machine-to-machine interoperability over a network (5 points)

2. For something to be a Web service it must use the following standards:

- ○ **a.** HTTP: Hypertext Transfer Protocol, the basic communication protocol of the Web (0 points)
- ○ **b.** SOAP: Simple Object Access Protocol, a standard for exchanging XML messages (0 points)
- ○ **c.** WSDL: Web Services Description Language, an XML format (0 points)
- ○ **d.** UDDI: Universal Description, Discovery and Integration, a "directory" format for exposing Web services (0 points)
- ○ **e.** XML: Extensible Markup Language, a flexible, standardized tool for describing various types of data (5 points)

3. My greatest needs for application development are:

- ○ **a.** organizing my development around business processes (5 points)
- ○ **b.** optimizing the sharing and reuse of software components across the enterprise (5 points)
- ○ **c.** inexpensively tying together the mix of applications that we have (5 points)

4. My greatest needs for the IT group's relationship with the business are:

- ○ **a.** allowing business leaders to determine how IT is used instead of IT limitations determining business processes (5 points)
- ○ **b.** providing simpler, less expensive integration with my partners and customers (5 points)
- ○ **c.** reducing our reliance on proprietary file formats and application interfaces (5 points)

5. The biggest needs in my IT architecture are:

- ○ **a.** cross-platform integration (5 points)
- ○ **b.** legacy system integration (5 points)
- ○ **c.** integration with external systems and applications (5 points)

6. My development team's knowledge of our business processes is:

- ○ **a.** what business are we in again? (0 points)
- ○ **b.** adequate but not exceptional (1 point)
- ○ **c.** above average (3 points)
- ○ **d.** so deep they could run the business themselves (5 points)

7. My development team members operate as follows:

- ○ **a.** they usually fall back on personal approaches to development because we don't have many established procedures (0 points)
- ○ **b.** they often fall back on personal approaches to development despite our attempts to establish procedures (1 point)
- ○ **c.** they generally adhere to our policies but may deviate occasionally when they feel the project warrants it (3 points)
- ○ **d.** they strictly adhere to our development processes and understand the need for following established procedures (5 points)

8. I plan to develop Web services in:

- ○ **a.** Java (5 points)
- ○ **b.** .Net (5 points)
- ○ **c.** other (such as Macromedia ColdFusion, Ruby on Rails, Ajax) (3 points)

9. For the bulk of my Web services development, the most critical feature of any application will be:

- ○ **a.** performance (0 points)
- ○ **b.** security (0 points)
- ○ **c.** scalability (3 points)
- ○ **d.** cost (5 points)

10. My service-oriented architecture (SOA) is:

- ○ **a.** what's an SOA? (0 points)
- ○ **b.** in the planning stage (1 point)
- ○ **c.** in the pilot stage (3 points)
- ○ **d.** fully implemented (5 points)

11. I'll fully engage in Web services:

- ○ **a.** when all appropriate standards have been established (0 points)
- ○ **b.** when all security standards have been established (1 point)
- ○ **c.** piecemeal, wherever standards are available (3 points)
- ○ **d.** right now, pragmatically extending and occasionally replacing proprietary pieces of my services with standards-based options (5 points)

12. My company plans to deploy Web services in the following way:

- ○ **a.** no plans to deploy Web services (0 points)
- ○ **b.** plans to deploy a few Web services in back-office applications (1 point)
- ○ **c.** plans to deploy a few Web services to business users (1 point)
- ○ **d.** plans to deploy a few Web services to partners and/or customers (1 point)
- ○ **e.** plans to use Web services enterprisewide to integrate applications and business processes (3 points)
- ○ **f.** plans to use Web services enterprisewide to integrate with systems and business processes of partners and/or customers (3 points)

Answers on Page 56 »

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Answers

1. Answer: C Web services offers a standard way of connecting two applications across a network and provides for efficient reuse of code. But you can't call any Web application Web services. Unless the application provides a uniform, XML-based interface for other applications to automatically take advantage of, it isn't Web services. And while some aspects of Web services mimic client/server computing, Web services isn't as restrictive: Two servers can act as peers and share data over a service, or even two clients.

2. Answer: E Web services doesn't need to employ an alphabet soup of standards. The technology can work across a variety of protocols, including HTTP, SMTP and FTP. Alternatives to SOAP exist (Representational State Transfer, or REST, has numerous adherents). If you're only producing a handful of services or don't plan on making them widely available, you won't need a directory. And if you do need one, you aren't restricted to UDDI.

3. Answer: Any or all Web services is not a silver bullet for aligning software development with the business. But if properly implemented, Web services can help you to build a software development framework that fits business processes more like a second skin than a back brace. Web services allows both for easier reuse of previously written code and a simpler way to make applications communicate.

4. Answer: Any or all Companies that have become heavy users of Web services offer their services as a menu from which business users can assemble new processes (for instance, integrating a help-desk app with CRM tools to let salespeople see which customers are having problems) that IT can deliver quickly. That makes it easier for the business to develop new products or relationships, and frees IT from the shackles of proprietary formats, allowing it to connect applications wherever that makes business sense.

5. Answer: Any or all Web services can handle any of the listed scenarios. Many companies use the technology as a way to make features from older systems or applications available to new applications. But it also works just as well for connecting a pair of Windows or Unix machines.

6. Answer: D Web services works best if it maps to business processes rather than the other way around. As a result, having a development team that's deeply aware of how your business works will help you make good choices, not only about how to create and manage services but about which services to create in the first place.

7. Answer: D, though C is acceptable Undisciplined gunslingers aren't the best players in the Web services game. You need a development team that plays by the rules. That means you have to establish a development process that values code reuse and cooperation among developers.

8. Answer: As many as possible Despite what some vendors tell you, there's no single best way to develop Web services. It pays to start with what you know (if you're a Microsoft shop, start with .Net, if you're committed to Unix, start with Java). But it's good to keep your options open. Using multiple development environments allows you to take advantage of emerging technologies regardless of platform.

9. Answer: D, though C is acceptable If performance and security are your primary concerns for a given project, Web services might not be the best approach. The loosely coupled, asynchronous nature of Web services and the paucity of mature security standards don't lend themselves to high-performance computing or tight security. But if scalability or cost is the key consideration, Web services should work. Well-built services should scale easily. And their reusability makes them cost-cutters.

10. Answer: D You don't need an SOA to start working with Web services—but it doesn't hurt. Developing an overarching plan for an SOA, of which Web services may only be a part, will provide a development map that you can follow no matter what business problem you need to solve or technology platform you decide to use.

11. Answer: D If you wait for all the standards to become established, you'll never move to Web services. WS-Security, the core Web services security standard, took years to reach its current state. And many open-source advocates are peeved that implementing it requires a license from IBM and Microsoft because they own patents for some of its technology. Friction between standards bodies and software vendors guarantees that standards development will go slowly.

12. Answer: B, C, D, E, F Web services are like fax machines: The more you have, the more useful they become. Connections between applications you might never have imagined connecting become possible with broad use of Web services. So keep your eyes open for new opportunities. CIO

Technology Editor Christopher Lindquist can be reached at *clindquist@cio.com*. Jonathan Eunice, principal analyst of technology research company Illuminata, also contributed to this quiz.

Scoring:

Are you ready for Web services? Tally your score and see. (Points are listed at the end of each answer on Page 54.)

0 to 39: Neophyte. You're still laying the groundwork for Web services before you're ready to get going. But you're thinking in the right direction.

40 to 79: You're getting your priorities in order. If your services are mainly in the pilot phase, it's time to think about moving them into production. If you have fully implemented some services, it's time to develop an enterprisewide strategy for Web services.

80+: Ace. You're ahead of the pack. As an early adopter, you're already getting business value from Web services. Keep doing what you're doing.

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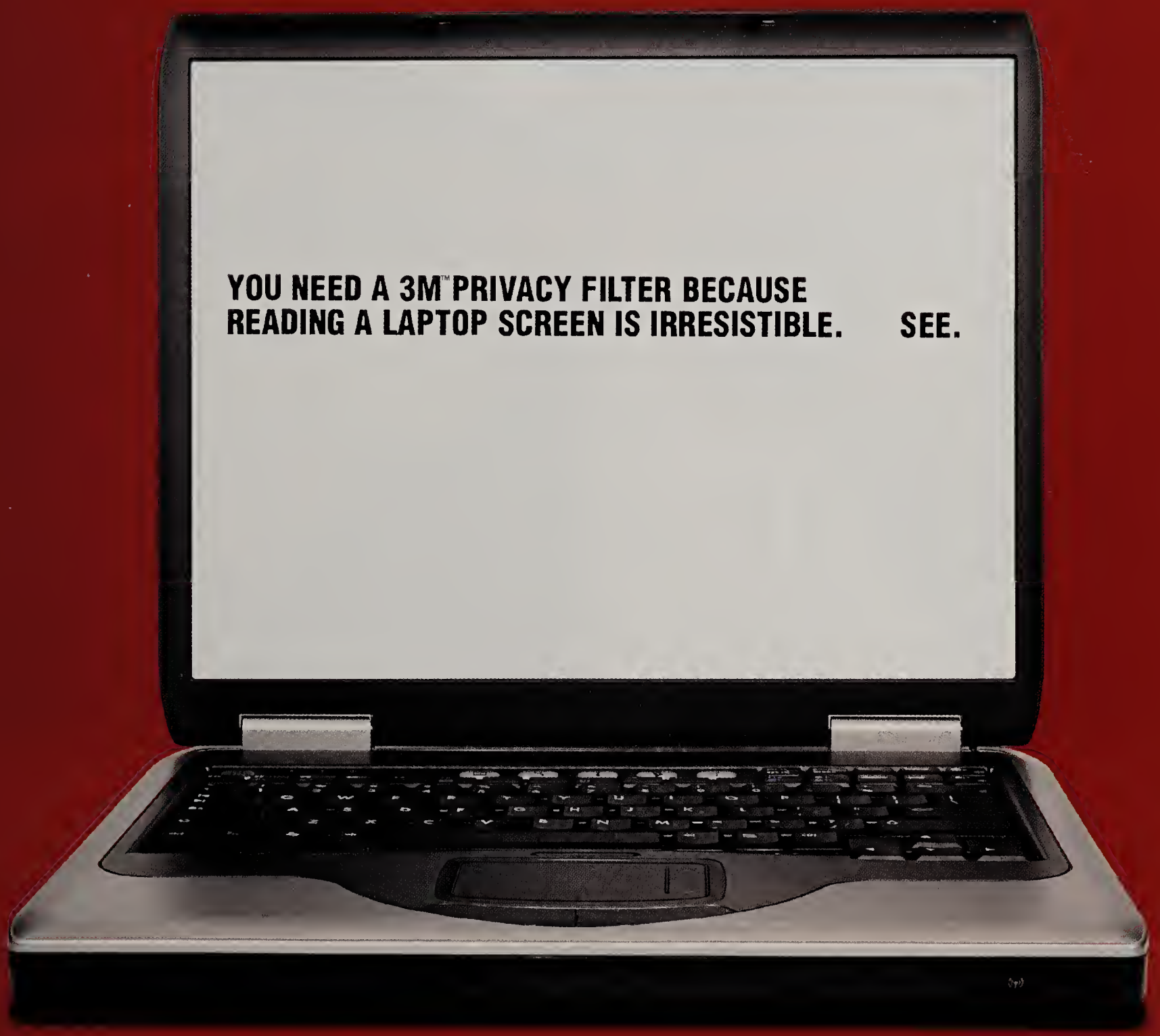

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The Four (Not Three, Not Five) Principles of Managing Expectations

CIO Joe Eng set new performance standards for his IT department, negotiated technical requirements with demanding business partners, calmed nervous end users and built a $500 million global network by following four simple principles

BY ALLAN HOLMES

The worst day in Joe Eng's career was the day he told his CEO that his company's most important IT project—a $500 million, state-of-the-art global network that is among this decade's most important IT initiatives in the financial services industry—would be three months late.

Eng is CIO of the Society for Worldwide Interbank Financial Telecommunication (Swift), a financial industry–owned cooperative that supplies messaging services and software that most of the world's banks use to send

Reader ROI

:: Why managing expectations for an IT project is critical

:: The differing concerns of senior executives, company employees and customers

:: Principles for defining and managing expectations

PHOTOGRAPH BY CLAUDIO VAZQUEZ

Swift CIO **Joe Eng** balanced competing demands from company executives and customers through constant communication and negotiation.

trillions of dollars in financial transactions daily. In February 2003, Eng and his team were testing the backbone of SwiftNet, the new network. With only a week before the two-year rollout of SwiftNet was scheduled to begin, the network monitoring software was not working reliably. Fixing the problem would take a few months. Eng's boss, Swift CEO Leonard Schrank, had to know.

And so Eng called Schrank at headquarters in Brussels with the bad news. Schrank was incensed. The last time Swift replaced its network, in the 1980s, the project was years late, and Swift's banking customers hadn't forgotten. What would they think now?

"The problem had a very visible repercussion," Schrank says. "This was like delaying a space shuttle launch, with all the political pressures." Eng endured Schrank's grilling.

But the pain was short-lived. By the end of the 10-minute call, Eng had explained the problem, offered a solution and reset Schrank's expectations for when SwiftNet would be ready. He would do the same thing a few weeks later, when he was called on to repeat the story to Swift's board of directors. Three months later, with SwiftNet

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fixed, the rollout began, just as Eng had promised.

Eng's encounter with Schrank may have been his most difficult moment, but there were many instances during the six-year project when Eng had to define—and then redefine—what he would deliver and when. For many CIOs, their toughest challenge is managing the expectations of senior executives, end users, IT staff and employees across the company, and the failure to address constituents' expectations undermines CIOs' credibility. In fact, expectations management can define whether or not your IT department is successful. ("Managing expectations" is one of five must-do items identified by *CIO*'s editors as part of the Leadership Agenda 2005 series.)

In Eng's case, Swift IT staff, business leaders and its 7,800 shareholders (who are also Swift's customers) all had their own ideas about what SwiftNet should be. Eng couldn't possibly accommodate everyone's demands, or predict every problem that might crop up.

But he could be prepared to deal with them. Eng knew that managing expectations for SwiftNet would require frank communication, creative planning and deft diplomacy. He devised a strategy that included training internal IT staff and other employees about SwiftNet and its goals, providing choices to customers without compromising standards or efficiencies, and satisfying board members and executive staffs within defined parameters.

"I understood that the project had to do with understanding the stakeholders and what their needs were and being flexible enough to meet them without straying too far off course," Eng says. "It's a sensitive balancing act."

A High-Stakes Project

SwiftNet was no minor upgrade. It represented a multigenerational advance in telecommunications technology that the global financial industry required in order to operate in the future. Global competition means banks need to close financial transactions in near real-time (rather than waiting days sometimes) and to offer new network-based services. Swift provides the primary messaging and transaction network that makes international finance possible.

Swift's 7,800 customers in 200 countries generate millions of messages daily in order to conduct trillions of dollars in transactions. These transactions range from the simple, such as exchanging foreign currencies, to the complex, such as clearing securities trades.

Swift's legacy network, built on 1980s X.25 technology, was an aging, albeit dependable, workhorse. But manufacturers who supplied hardware for the network were closing out production of their old products. Furthermore, the cost of maintaining the network, at nearly $60 million euros a year, was increasing—costs that were passed on to customers. Most importantly, financial institutions wanted new messaging services that would allow them to offer Web-based products to their customers, decrease financial risks and lower their operating costs. One service the banks wanted was instant messaging that would alert them when a transaction was completed. Other customers, including John Galante, CTO with JPMorgan Worldwide Securities Services, needed more bandwidth to deal with a growing volume of securities trades.

The project had numerous risks, not the least of which was that any malfunction of SwiftNet during the migration would disrupt transactions and cost customers money. "The biggest challenge was how do we do this conversion while we support the ongoing business," says Galante. Mistakes held the potential to bring international finance to a halt. "If SwiftNet were down a day, we would have a worldwide crisis," says Mike Fish, deputy CIO for Swift. Swift executives worried that any major failure would encourage customers to abandon SwiftNet for Internet services offered by telecommunications vendors.

Eng knew, however, that conflicts and problems were inevitable. "I knew [managing expectations] was going to be my number-one job, and I needed help," Eng says. He found it in a set of four principles for ensuring that everyone understood what they had to do, what IT would deliver and when.

Principle #1

Define Expectations Internally

Eng set as his first task making sure his staff understood why new messaging technology was needed and how they would approach designing, building and deploying it. Previous projects, including the last network upgrade, had fallen short because the IT staff spent too much time debating technologies and approaches to development.

Eng assembled a cadre of senior and middle managers from throughout the company whom he thought employees admired and trusted. If these managers bought into a common approach to the project, the staff would take their cues from them. The debates about technology and deployment strategies would be minimized.

"I needed these vanguards out there in the company selling the idea of change because I spent a lot of my time working with executive management, the board and customers," Eng says. "[And] I just didn't have the time."

Eng is an Apollo mission buff and an avid reader about the subject. The astronauts in the Apollo program, as portrayed in Tom Wolfe's 1979 book, *The Right Stuff*, had developed strong communication skills, along with an ethic of teamwork and trust. Eng sought to replicate their camaraderie, and so, working with Swift's human resources director, he devised a leadership training program (which he called The Right Stuff) to impart the necessary skills to his management team.

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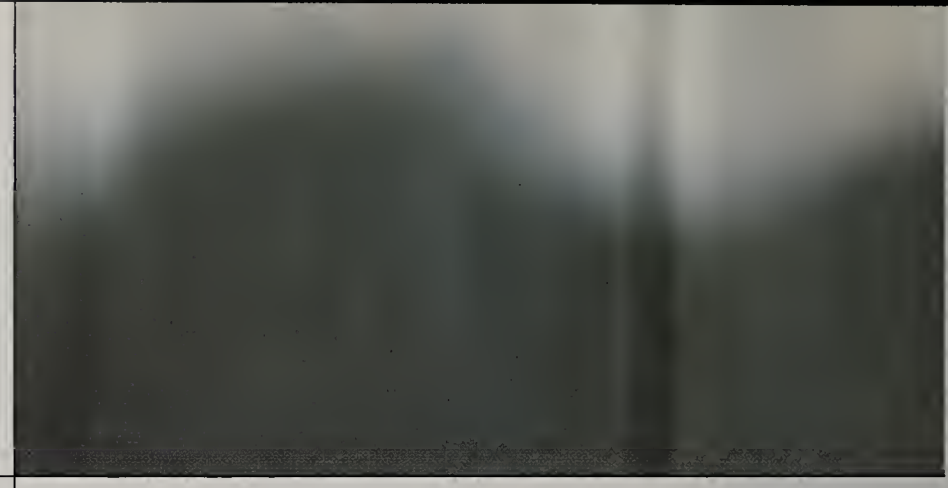


In keeping with *The Right Stuff* theme, Eng borrowed the famous line, "Failure is not an option," from the 1995 movie *Apollo 13*. The IT shop adopted the line as its motto, and it soon became a guiding principle within Swift. The expectation was set: When problems cropped up, the IT team would manage them and learn from them without letting the project get derailed.

On past projects, there had been little collaboration within the IT department or across Swift's business functions, so Eng sent his first class of trainees (mostly those decision-makers involved in the design, architecture and operations of SwiftNet) to NASA to learn teamwork. At the US Space and Rocket Center in Huntsville, Ala., they rode in a space shuttle simulator for a team-building exercise, and NASA staff taught Swift managers how to make decisions quickly. Astronauts Wally Schirra, Dave Scott and Alan Bean told the group about trusting their colleagues.

The class returned to work with a plan for building a cohesive project management group by creating flexible teams for design, operations and testing. The managers also reworked the way Swift's IT department measured performance. Rather than measuring the amount of time spent on specific tasks, managers would measure the results of the work.

The Right Stuff group also instituted town hall meetings twice a year at locations worldwide, where speakers from across the company helped allay fears that SwiftNet would not deliver the services users needed or that the IT staff was out of touch with those needs. "What this did was narrow and align people's expectations to a common set," says Eng.

Principle #2

Establish Rules of Engagement

Eng knew that if he tried to satisfy too many stakeholder requirements for SwiftNet he would end up with a mess.

Most customers felt strongly that they needed everything they wanted, and they expected Swift to accommodate them. Rather than debating every idea with every customer, Eng decided to develop SwiftNet through pilots with a subset of representative customers. Whatever functionality was built into the pilots became the basis for SwiftNet's requirements. The pilot customers understood what to expect from the system because they had been involved in deciding what they would get. They could then effectively manage the expectations of other customers by becoming public supporters of the system they helped build.

For example, Eng and his team used the pilots to determine which platforms SwiftNet would support. They settled on three platforms that would accommodate the largest percentage of customers while keeping the system cost-effective: Sun Solaris, IBM AIX and Windows (for smaller banks). By standardizing on these platforms, Swift was able to oblige 80 percent to 90 percent of its customer base.

While Eng had never promised to support everyone's legacy systems, that didn't stop customers from lobbying for their unique platforms. "They came in waves," Fish recalls. "At meetings, there were people pulling board members and our people aside to say, 'Hey, I know you can't include everything, but we have a VAX. You have to make it work with that too.'" Pressure to add requirements also came from within Swift, as the marketing and sales staff pushed for services they could sell to customers.

Eng managed all of these requests by using a standard process for determining ROI. The litmus test for a requirement was whether it had a positive ROI for the customer. If it didn't, Eng's staff would point out the requirement's downsides, and most customers would agree that the consequences were not worth the effort. Another argument Eng and his staff employed was to explain that the requirement could not be done technically or within the given time frame (he might agree to put off the requirement for a later release).

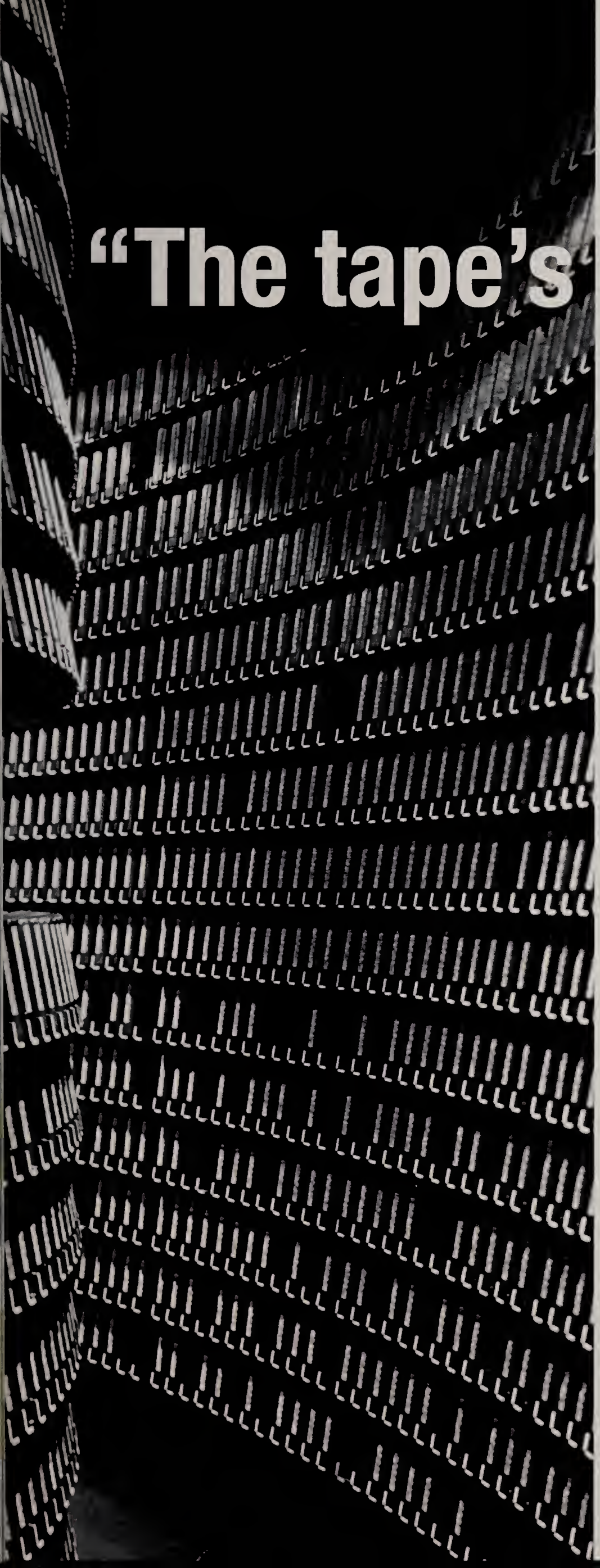
The bottom line was that the new messaging services had to benefit the vast majority of the banks. "I would say, If you can show me how to justify it, then we'll do it," says Eng. Using this approach, Eng and the IT staff settled on the services and messaging capabilities the new SwiftNet would offer.

> Pilot customers understood what to expect from the system because they had helped decide what they would get.

Principle #3

Deal with Doubters

The CLS Group, a foreign exchange service based in London and one of Swift's bigger customers, was one of the participants in a



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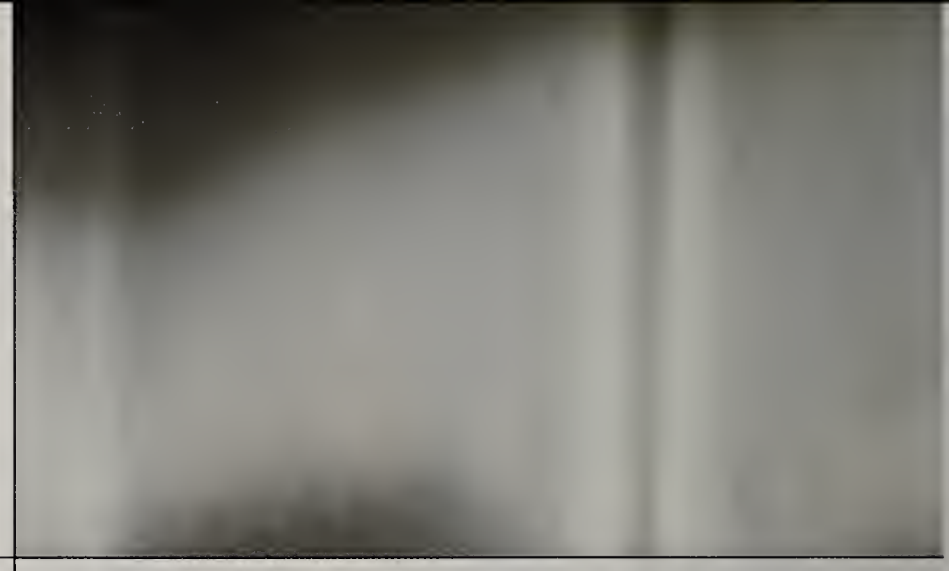

SwiftNet pilot. As the day approached to launch the pilot, CLS executives were getting nervous. Testing of SwiftNet had produced the inevitable bugs and glitches, and CLS began to second-guess whether the network would be as reliable as Eng had promised. They weren't even sure who exactly was responsible for setting up interfaces between CLS's platform and SwiftNet—Swift or CLS's operating systems vendor, IBM.

CLS executives wanted to clarify responsibilities for the project, so they asked Eng to meet with them and IBM. "There would have been no second chance if it could not be shown that the end-to-end system worked effectively," says Rob Close, group CEO at CLS (he was then the chief operating officer).

To prepare for the meeting, Eng asked the project manager and technical director to find out whatever they could about how IBM viewed its role in the project. He also made himself aware of the source of the confusion (a disagreement about what was causing the problems during testing—IBM's application or SwiftNet's difficulties interfacing with IBM). "I didn't want to be surprised, and I wanted to be honest and stick to the facts," Eng says. After numerous meetings, Eng clarified Swift's and IBM's responsibilities for the deployment.

CLS executives were satisfied. "Joe showed a sense of pragmatism and goodwill to find the way forward in what otherwise could have been a difficult circumstance," Close says.

Principle #4

Not Everything Is Negotiable

Finally, in the summer of 2003, SwiftNet was ready to roll out, and Eng came face-to-face with an expectation from customers that was nonnegotiable. He had to meet the deadline for deployment.

Eng had wanted to recapture the time he lost earlier in the year, when he was sidetracked by the network management glitches, as well as build in time to deal with complications. To compensate, he wanted to move the completion date for the rollout from December 2004 to mid-2005. He was concerned that Swift's largest users would need 18 months to migrate to the new system. Banks had to follow a complicated process to migrate to SwiftNet that included deploying a pilot before they would be ready for full operation.

But slowing down the rollout wasn't an option, according to Y.B. Yeung, head of information technology in the Asia-Pacific region for Hong Kong & Shanghai Banking and a member of Swift's board of directors. "Any delay would be a sign that Swift was not meeting customer demand," says Yeung, who chairs the board's technology and policy committee. Galante adds, "Holidays, planning for disaster recovery, regular system upgrades took time. If anything, we wanted to go faster." Eng went back to his staff with the message that the deadline was not moving.

Within two months, Eng presented a new deployment plan that both met the deadline and addressed his concerns that banks have enough time to get the migration right.

Eng's original plan was to assign countries to "windows," in which Swift's smaller customers in each country or region had a set time to migrate to SwiftNet. Large customers had their own migration schedules. To make up for lost time, Eng devoted additional resources to quality assurance before the migration began. In addition, his staff found ways to add the large customers to each country window or overlap the beginning and end of each window so that more banks were migrating at a time. To simplify the process for ordering services, Eng's team created an online application for customers to place their orders.

The migration was completed on time, with no notable problems, according to Yeung. Yeung gives Eng high marks for his responsiveness to customers. "He says, 'I hear what you are saying,' and then he goes back and sees if there are ways to meet your needs. That way he [is] innovative in identifying solutions."

In other words, Eng and the IT department succeeded and earned credibility by effectively managing stakeholder expectations. CIO

Pressure to add requirements was managed using a standard process for determining ROI.

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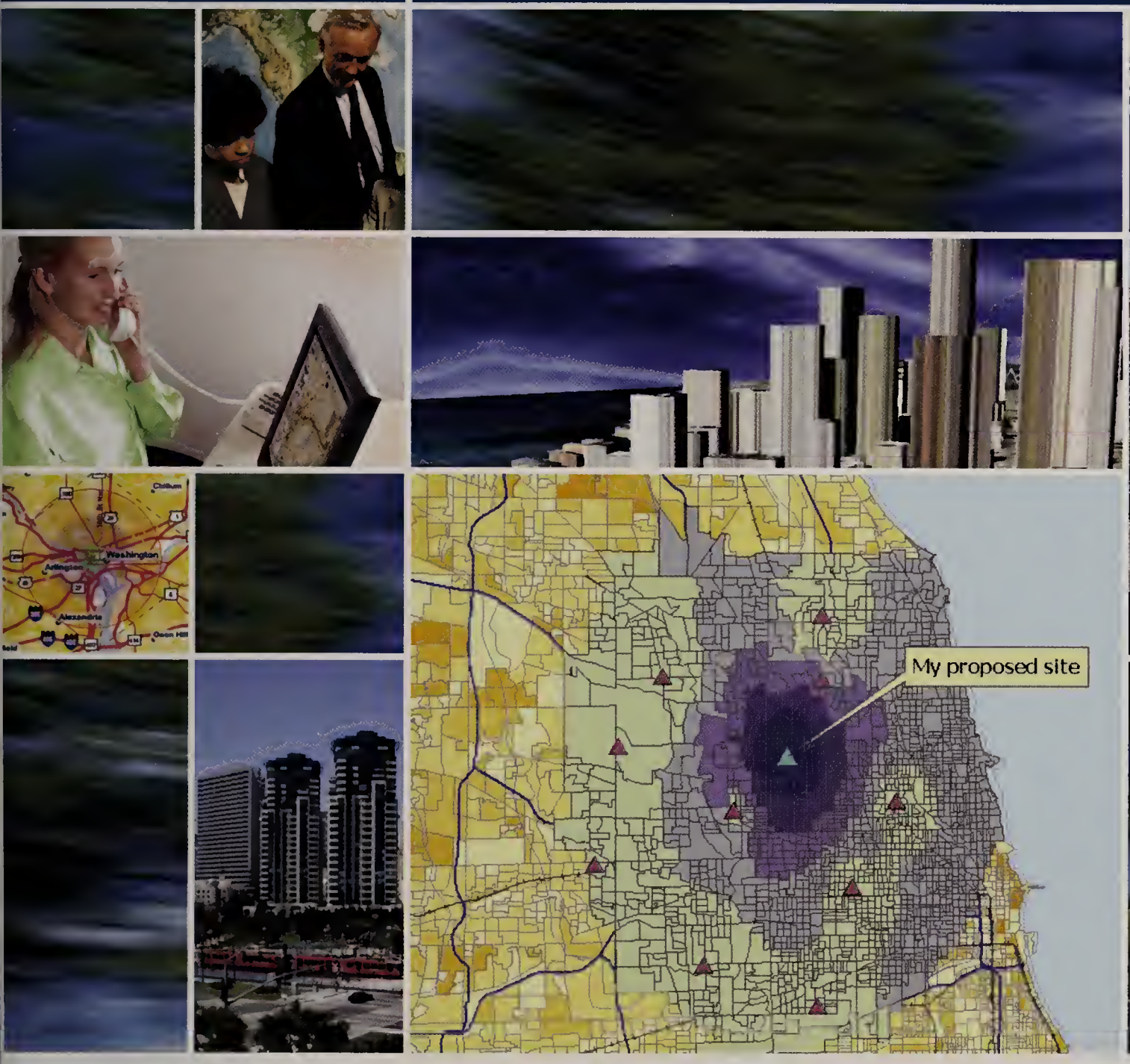

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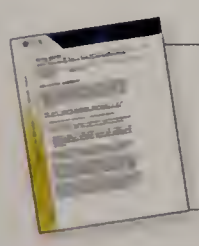

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Seeing No Evil

CIOs are growing increasingly frustrated at the laissez-faire attitude of many ISPs toward security. Is it time to consider regulating the ISP industry?

BY MATT VILLANO

In a mock courthouse earlier this year, the smack of a gavel opened a case for the ages. Behind one bench, the defendants: Internet service providers, on trial for not providing adequate security to their customers. Behind the other bench, the plaintiffs: fictional companies ravaged by distributed denial of service (DDoS) attacks. The jury: hundreds of IT security professionals, packed into a conference room at the Gartner IT Security Summit to watch it all unfold.

The plaintiffs argued that ISPs could do much more to improve security by scanning subscriber computers, monitoring traffic and shutting down suspicious network uses. The defendants claimed that performing such scans would violate user privacy and that it would be impossible to distinguish

Reader ROI

:: Why ISPs don't consider securing the Internet their responsibility

:: Arguments for and against regulating ISPs

:: What CIOs can do to secure their networks

ILLUSTRATIONS BY ANTHONY FREDA

malicious traffic from legitimate e-mails.

Accusations flew. The plaintiffs equated ISP intransigence to that of a homeowner whose property is dangerous but doesn't buy a fence to keep others out. In response, the defendants said people should stay away from dangerous property; that safety is a responsibility that falls squarely on the individual. Next, in a rhetorical ploy, defense lawyers asked jurors if any of them would be willing to stay at a hotel that offered Internet access in exchange for the right to scan all computers for security vulnerabilities. Not one member of the audience raised a hand.

Around and around the two sides went, attacking each other like packs of wolves. The interchange got so heated at times that people almost forgot it was fake. Someday soon, however, this scenario could be real. As security threats such as DDoS attacks, identity theft and phishing continue to plague the Internet, ISPs find themselves under increasing pressure from business and consumers to eradicate risks before they get to the end users. Because ISPs control the pipes through which information is delivered, many customers, including CIOs, insist that service providers must play a more active role in securing the traffic that they deliver.

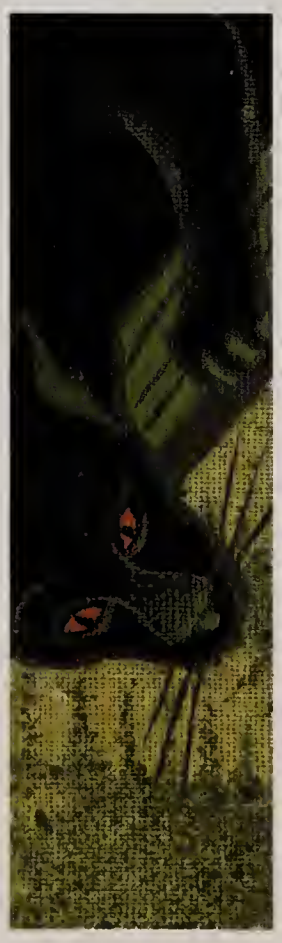
"Right now, all ISPs provide is entry to the Internet, period," says Stephen Warren, CIO of the Federal Trade Commission. "Believe me, it's in their best interests to get all the crap off their lines."

As Warren implies, the time for action is now. If water utilities can be required by state and local governments to deliver water that is clean and acceptable to drink, why can't ISPs be required to deliver data that is safe and threat-free? Such requirements would hold ISPs accountable for cleaning up their networks and force them to monitor traffic as it passes through their pipes for maliciousness of all kinds. Regulating ISPs in this way also would relieve at least some of the security burden from CIOs, freeing up more time, money and resources for other areas.

But so far, those types of government regulations and industrywide policies governing ISP security do not yet exist. In part, that's because ISPs came of age in the Wild West ethos of the Internet, and providers generally have been unwilling to spend the extra money and resources to secure the middle of the information pipe for all of their users. In addition, many ISPs think that if they become security cops or anything more than traffic carriers, they will be legally liable in the event of security breaches. They are also concerned about censorship issues and blocking legitimate e-mails that look like spam.

How valid are these concerns? Should ISP security be regulated much like utilities (and to a lesser extent, the airlines) are now? Are industrywide polices governing security even feasible? These were among the questions that jurors considered as they deliberated over a verdict at the Gartner mock trial. CIOs struggling to secure their own networks must stand among those who consider these questions and look for answers. After all, what's at stake is the viability of the Internet as a medium for commerce, communication and business connectivity into the 21st century and beyond.

"Security is something that everybody is accountable for—everybody including the ISPs," says Michael Vatis, an attorney at Steptoe & Johnson, a law firm in New York. "There has to be a better way to approach this than how we're doing it today."



The First Line of Defense

There is a relatively easy way to block the avalanche of spam that creates DDoS attacks. But many ISPs don't bother deploying it.

AMONG THE ISPS that offer security, many of them attempt to do so by blocking traffic through Port 25, the server port used for simple mail transfer protocol (SMTP) transmissions. This practice prevents e-mail from in-network computers from going to any other mail servers on the Internet unless the mail first goes through central ISP mail servers or a mail server that has been added to an exception list.

Dave Jevans, chairman of the Anti-Phishing Working Group (*www.antiphishing.org*), says the method is widely considered to be a best practice for detecting and preventing spam and phishing senders on ISP networks. Many of these senders are zombies (also know as bots), which are often also used for DDoS attacks. Yet this method of blocking is not common practice in the ISP industry today.

Some ISPs, including SBC, EarthLink and midsize ISP Jumpline.com, also block inbound traffic through Port 25 as well. Tripp Cox, CTO at EarthLink, claims this less-common tactic is done to prevent infected computers from becoming part of a botnet, which is used to send spam and infect other computers to spread destruction.

To make sure all mail servers are legitimate, EarthLink and others force users to upgrade to a more substantive business account for the privilege of running SMTP servers from inside the network. ISPs say this helps them keep inadvertent open mail relays to a minimum, further reducing the risk of a spam zombie attack.

"Blocking Port 25 is the first step toward stopping DDoS attacks as a whole," says Cox. "It's the very least an ISP can do behind the scenes to make the connection more secure." *–M.V.*

"Rather than expend resources to try and stop all these threats, most ISPs are taking the opposite approach and doing nothing."

—RICHI JENNINGS, FERRIS RESEARCH ANALYST

The Wild Wild West

Much of the ISP industry's unregulated growth can be traced to the Telecommunications Act of 1996, the first major overhaul of telecommunications law in 62 years. The goal of the law was to create a free-market economy in which any single communications company could compete in any marketplace. According to Jonathan Zittrain, cofounder of Harvard Law School's Berkman Center for Internet and Society, the law and subsequent other FCC rulings opened the way for outfits promising to provide Internet service. All one needed to become an ISP was some cash, a few servers, the bandwidth to host real estate and a marketing plan to bring in customers. David McClure, president and CEO of the U.S. Internet Industry Association, estimates the number of ISPs today to be more than 400.

As ISPs grew helter-skelter, there was very little effort to standardize security on any level. The only real attempt came in 2003, when Congress passed the Controlling the Assault of Non-Solicited Pornography and Marketing (Can-Spam) Act, which established requirements for sending commercial e-mail, spelled out penalties for spammers and companies whose products are advertised in spam, and gave consumers the right to ask spammers to cease and desist.

The law has been less than successful so far. Ask any CIO about what keeps her up at night and the general answer is security. Since 2003, the number of security threats has skyrocketed, with the typical suspects being viruses, spam, phishing scams and spyware. The new kid on the block, the DDoS attack, complicates matters even more. In this scenario, hackers use computer worms to take over vulnerable computers on corporate networks around the world. Then they tie the computers together through an Internet relay chat (IRC) server called a botnet. Unified as one, the rogues (or zombies, as they're sometimes called) set their sights on one particular corporate Web server, and simultaneously bombard it with data requests until the burden brings it down. These networks are responsible for 50 percent to 80 percent of all denial of service spam, according to various estimates.

Even among CIOs who spend millions on security, actions to prevent these threats breed nervousness. How do you know your firewall is equipped with the latest intrusion prevention signatures? How do you stop other threats such as viruses and spam? Most important, how do you protect yourself against spyware programs that infect vulnerable endpoints and turn them into zombie computers that launch DDoS attacks upon command? Just when CIOs think they've got everything under control, the hackers outsmart them and devise new ways to compromise a network's security.

"We are constantly bombarded," says Dewitt Latimer, deputy CIO at Notre Dame University, where the challenges of an inherently open academic network have him constantly on edge. "I find myself wishing that ISPs would help us out a little bit, if for no other reason than to eliminate a fraction of the security problems we worry about on a day-to-day basis."

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"At the end of the day, ISPs need to be held accountable for more of these security violations."

–BOB PAARLBERG, CIO, ROYSTER-CLARK

Latimer adds that he assumes anything that is not on a private network is insecure. But what if some of these issues were resolved before traffic ever arrived at the network door? Since all external traffic must, at some point, be transported over the Internet, many CIOs say there's no better way to secure it than by securing the pipes themselves. Because ISPs serve as the conduit for all traffic into and out of a network, CIOs say these providers should be scanning subscriber computers for viruses, monitoring traffic for active hack attacks, and shutting down suspected network users immediately to protect the safety and sanctity of the connection for everyone else.

Why ISPs Are So Hands-Off

Richi Jennings, an analyst with Ferris Research in San Francisco, says that many ISPs wash their hands of these issues because such security measures are neither cost-effective nor conducive to revenue generation. For ISPs to be successful, they need volume, and resources spent on filtering malware or scanning subscriber computers ultimately affect the bottom line, Jennings says.

A perfect example of this philosophy is the ISP help desk. File a spam complaint with an ISP and Jennings notes it can be days before you receive a response, if you receive one at all. In most cases, he says, the response is automated. Sure, the ISP could be filing complaints away and pursuing them at a later time, but Jennings says that despite recently publicized lawsuits in which ISPs sued spammers for violating the Can-Spam Act and older state laws, most violations fly under the radar, even after they're reported.

"Rather than expend resources to try and stop all of these threats, most ISPs are taking the opposite approach and doing nothing," Jennings says. "It's just not a priority."

Kevin Dickey, deputy CIO and CISO for Contra Costa County, Calif., recently experienced this firsthand. After an attempted DDoS attack on the county network, Dickey asked his ISP for incident reporting logs. Though many ISPs keep these logs, Dickey's did not. So it was very difficult for him to identify and fix the hole the hackers had used to launch the attack (eventually he did patch it). Dickey declines to name the ISP because he says he's generally happy with it, but admits that the entire experience shocked him into realizing that security wasn't as much of a priority for the ISP as he had been led to believe.

Lawyers wonder if one reason ISPs shy away from security is a legal one. According to Benjamin Wright, a Dallas attorney who participated in the mock trial and specializes in Internet law, ISPs don't want to guarantee security because that could conceivably put them at risk for a negligence or invasion of privacy lawsuit. Wright alleges that scanning subscriber computers could violate privacy laws even after the packet leaves the desktop. Also, what happens if an ISP conducts a scan and blocks 100 threats but misses one? Zittrain says that if ISPs start taking responsibility for more than just carrying traffic, they could be making themselves legally liable. No lawsuits have been filed for this kind of negligence so far, but Zittrain says that an ISP knowingly permitting a zombie computer to remain on its network, which then wreaks havoc, could find itself sued. However, he doubts ISPs can be held legally accountable unless they have promised to protect

their customers completely. "That's precisely why they're not promising complete protection," Zittrain says.

Scanning isn't the only legal quagmire. Even if ISPs could scan all incoming e-mail, it's nearly impossible for them to distinguish between, for example, a computer being used in a DDoS attack and legitimate Internet traffic such as the Weatherbug, which automatically checks National Weather Service servers every five minutes for regional weather updates. And just as ISPs can get themselves into hot water for blocking legitimate e-mail from a network, Zittrain says, they also can cause trouble when they are overzealous in monitoring legitimate e-mail going out of a network.

"If a customer is sending out 25 messages a day and suddenly blasts 500, that's a red light that maybe they have a spam zombie in place," says Don Blumenthal, Internet Lab Coordinator at the FTC. "Of course it also might be that the customer has just become [Parent-Teacher Association] president and is using his work computer to send out some personal e-mails. You just never know."

Down the road, perhaps the biggest security challenge could come from the increased use of encryption. For instance, Vista, the new Microsoft operating system that is expected to debut next year, streamlines point-to-point encryption across the Internet. As a result, ISPs and security vendors alike may have trouble determining which e-mail packets are legitimate and which are malicious, possibly giving hackers unmitigated opportunities to wreak havoc everywhere.

The ISPs say it's not as if they don't care about security. But because they operate in a free-market economy, the decision to provide security is one each provider makes individually. America Online, Comcast, EarthLink and SBC—the four largest ISPs by number of subscribers, according to a June 2005 market report from JupiterResearch—all provide users with some rudimentary security services in the form of standard e-mail filtering and antispyware protection. EarthLink, SBC and some other ISPs also attempt to prevent virus and worm outbreaks by blocking traffic through Port 25, the server port used for simple mail transfer protocol, or SMTP, transmissions. (For more on how this works, read "The First Line of Defense" on Page 70.) Many other ISPs provide additional security to specific corporate customers at extra cost. And then there are those ISPs that don't bother with security at all.

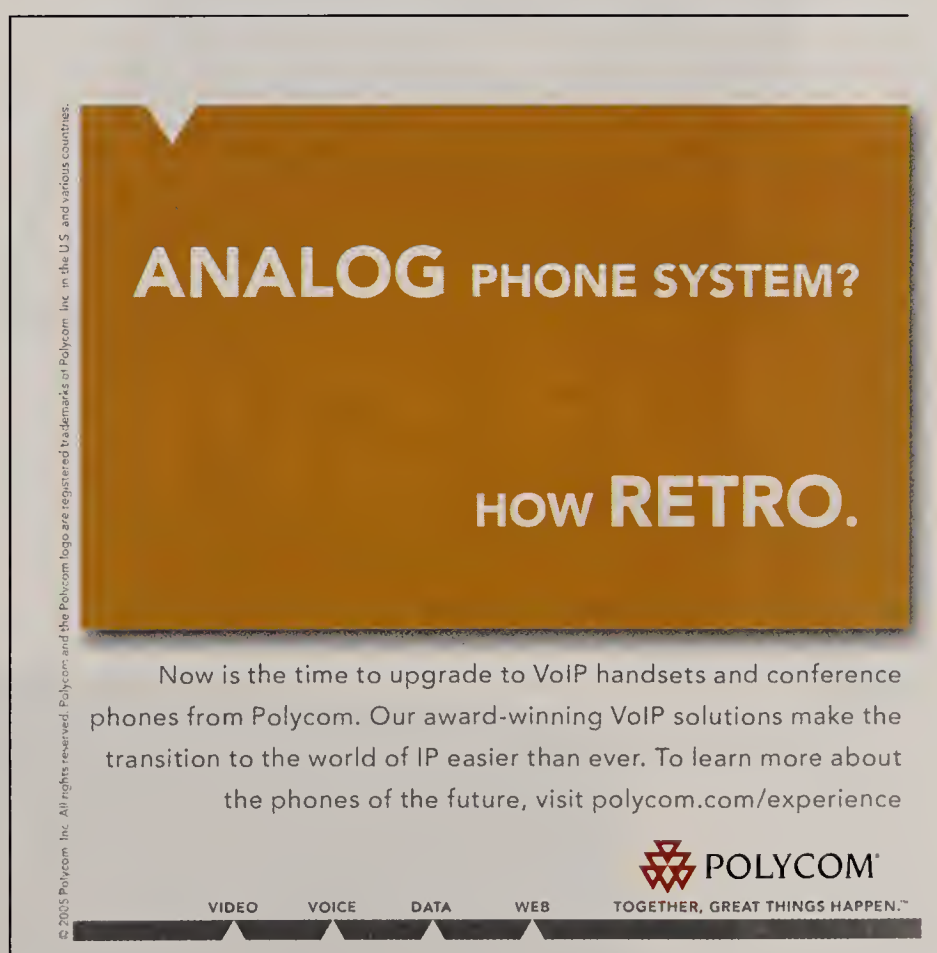
ISP executives say a more standardized approach to security would be cost-prohibitive—and it might not be what their business customers want anyway. "When you're dealing with security, there's simply too much at stake for us to offer a one-size-fits-all solution that works for everybody," says Stan Barber, vice president of engineering operations for Verio, an ISP and a subsidiary of NTT Communications. "What's important for one company might not be important for another, and we need features that can scale."

You don't need to be a mathematician to see that this patchwork coverage puts everyone at risk. With bits and bytes traveling from one ISP's network to another, who's to say that a security threat stopped by one ISP filter won't escape another network that doesn't filter or does it inadequately? Gregg Mastoras, senior security analyst for North America with the network security solutions provider Sophos, says that once a threat gets past one ISP, it essentially has gotten past them all. Mastoras adds that since information on the Internet knows no borders, everyone is at risk. If the security that ISPs currently offer is really as good as they say it is, this wouldn't be a problem. Yet one just needs to look at the news today to know that corporations are getting hit hard by all manners of malfeasant code. The problem, says Mastoras, is that nothing exists to standardize security across the ISP industry, making everyone in the industry susceptible to the lowest common denominator.

How to Protect Yourself in the OK Corral

ISPs may not be able to get away with this free-market approach for long, if only because pressure from government, industry and consumer groups is growing. This May, the FTC said it would soon ask ISPs to make sure that their customers' computers haven't been hijacked by spammers with plans to create botnets. Though ISPs are not required to comply, the FTC suggested that service providers should identify computers on their networks that are sending out large amounts of e-mail and quarantine them if they are found to be zombies. One final recommendation from the FTC: Internet providers should route all customer e-mail through their own servers (as opposed to allowing individual users to route e-mails through their own servers).

ISP executives are optimistic that the industry can regulate itself. Dave Jevans, chairman of the Anti-Phishing Working Group, says a number of ISPs have already banded together to discuss security best practices. If the industry can't improve security on its own, there's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always the possibility of regulating it through state or federal legislation, but that's something that most in the ISP industry firmly oppose. Howard Schmidt, president and CEO of R&H Security Consulting and a former official with the Department of Homeland Security, agrees that legislation is not the answer, saying that most ISPs would simply pass the cost of compliance along to users in the form of increased monthly and annual fees.

For Schmidt, there is another way. He suggests that government facilitate change simply by wielding its own purchasing power. If, for instance, government agencies offered ISPs a 10 percent premium to provide reliable security services across the board, Schmidt believes the agencies could get ISPs to comply in exchange for the extra cash. This change, in turn, could have a trickle-down effect that improves the situation for business customers and CIOs alike.

"With the government being a large purchaser of IT services, they have the ability to say, 'Here's what I'm willing to pay for,' and actually pay for it," Schmidt says. "Having controls built in as part of government projects gives you the side benefit of making it happen for private companies."

In the meantime, the SANS Institute, a private security education organization, is planning to evaluate ISPs on the way they handle security and release an ISP Security Report Card this month. Alan Paller, director of research for SANS, says this card will outline the steps CIOs can take to seek a greater level of security from their ISPs. (For more on this, see "ISP Essentials," this page.) In addition, Jennings, the Ferris Research analyst, says CIOs should combine whatever basic protections their ISPs offer with a customized security infrastructure comprising hardware and software for a multilayered approach that incorporates two or three antivirus engines (at the perimeter and on the desktop machines), a firewall, intrusion prevention software and any other functions that specifically suit an organization's needs.

One area in which Paller says CIOs can advocate for better security from ISPs is through their service-level agreements, or SLAs. Traditionally, these performance contracts with the ISPs loosely have covered issues such as uptime and maintenance or support. However, Paller suggests that CIOs should consider at least trying to get their ISPs to agree to incorporate security metrics such as virus scanning, DDoS monitoring and incident reporting, as well.

SLA clauses, however, are no panacea. Bob Paarlberg, CIO at Royster-Clark, an agri-business company, says that putting security into an SLA will do nothing but lull CIOs into complacency—not exactly a state that engenders secure networks. "Our SLA is that we don't sign a long-term agreement," Paarlberg quips. "If you do a good job for us this month, you earn the business from us next month. That's it."

Ultimately, Paarlberg contends, the best way to get ISPs to tackle security is to force them to bake-in additional security by law. Just look at what happened in the airline industry. Years ago, scanning passengers for security threats was the responsibility of individual airports. The result, of course, changed our nation forever: Terrorists took advantage of the weak points in the system, and successfully orchestrated the attacks of Sept. 11, 2001. In the aftermath, the federal government created the Transportation Security Administration to set policy for securing air travel nationwide. Today, whether you're traveling from Baltimore, Md., or Billings, Mont., you and everyone else on your flight are screened the same way, and by and large, the system is a lot safer than it was before.

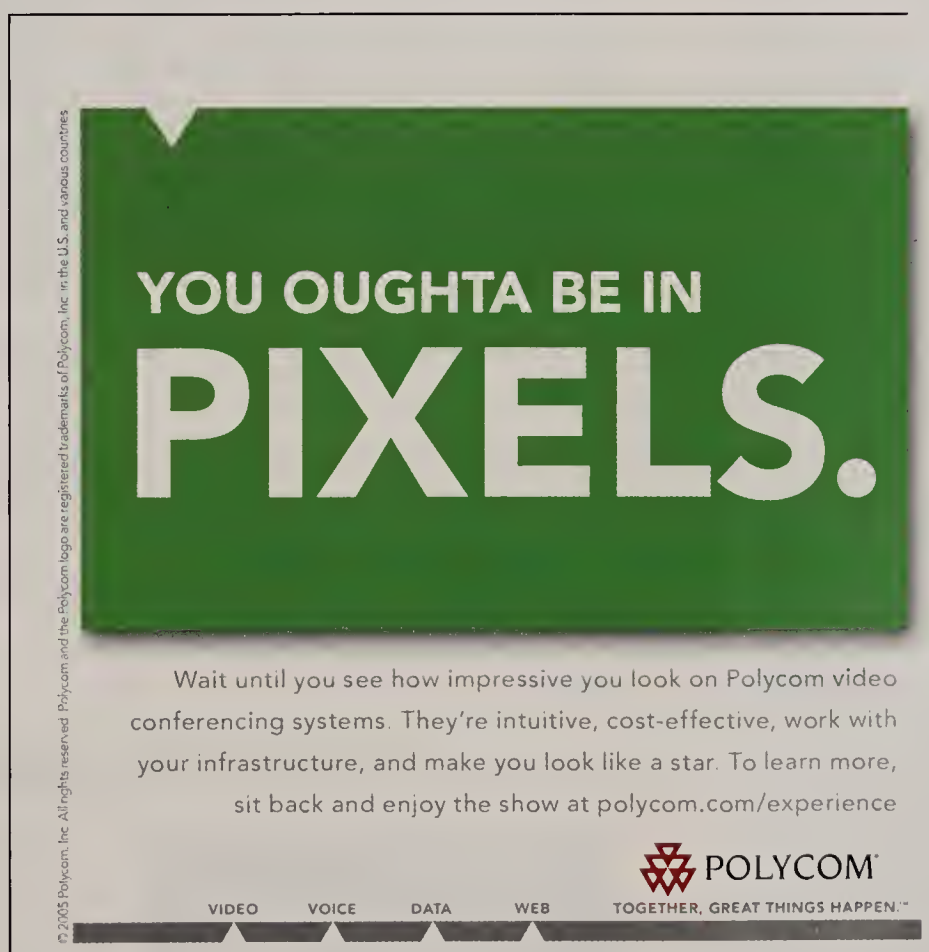
"At the end of the day, ISPs need to be held accountable for more of these violations," Paarlberg says. "If they're going to continue to bring threats to our doorsteps, something must be done." CIO

ISP Essentials

When you're in the market for security services, here are a few things you should demand from your ISPs

- **Ask for DNS protection,** which will help you keep your Web servers free of DDoS attacks from outside the network.
- **Inquire about line filtering,** which will eradicate known viruses, spam and spyware from all traffic that heads toward your network perimeter.
- **Request egress filtering,** which protects against botnets by guaranteeing that messages are coming from their specified place of origin. *–M.V.*

Matt Villano is a freelance writer and editor based in Half Moon Bay, Calif. Send your comments to Executive Editor Alison Bass at *abass@cio.com*.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The Right Dose of Technology Helps the Medicine Go Down

Computerized physician order-entry systems are like other tricky enterprisewide implementations. They require a tremendous amount of tinkering and monitoring to get right.

BY SUSANNAH PATTON

As a medical resident at the Hospital of the University of Pennsylvania (UPenn), Dr. Scott Halpern spent hours at his hospital's computer terminals searching for the right tests and medications for his patients. But Halpern would often become so frustrated with the system—which was slow and required specific language for each request—that he would give up and stop using the system when he could find another way to take care of the patient.

Halpern is much happier with his hospital's newer, more user-friendly order-entry system. But he still sees problems. One of the biggest, he says, is the annoying alerts that constantly pop up onscreen as he orders a patient's dosage. "I honestly haven't paid attention to a pop-up alert in years," says Halpern, who like many doctors believes that alerts should be limited only to those that might help avoid a serious medical error. "I just

Reader ROI

:: Why computerized order-entry systems can sometimes introduce medical errors

:: How to avoid such errors by involving the users (doctors and nurses) early and often

:: Why order-entry projects have to be customized and closely monitored

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Benjamin R. Williams, CIO at St. Joseph Health System, says the key to a successful CPOE implementation is working closely with the medical staff to design a system that makes their jobs easier and less stressful.

click right through them as quickly as possible and I think most doctors do the same thing," he says.

Those pesky alerts were designed to prevent medication errors, but because they pop up so often, many are ignored. Halpern's frustration with such a poorly designed feature reflects an ongoing struggle with computerized drug-order systems at hospitals across the country. Computerized physician order-entry, commonly known as CPOE, holds great promise to improve patient safety as it radically changes the way that doctors, nurses and hospital employees do their jobs. CPOE is still in its early phases—only 4 percent of U.S. hospitals are using the systems according to consultancy Klas Enterprises—but research shows it can improve patient safety. Studies at Brigham and Women's Hospital, where informatics leaders developed their own system in the 1990s, revealed that CPOE cut medication errors by 80 percent. And nationwide adoption of CPOE could save $44 billion a year in reduced costs from radiology, laboratory and medication errors, according to a study by the Center for Information Technology Leadership.

Doctors such as Halpern agree the new systems are superior to the pen-and-paper method of prescribing medication, which can lead to misunderstandings and transcription errors. But early experiences with CPOE show that success involves much more than plugging in the

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software. Those at the forefront of CPOE adoption agree that systems are expensive and difficult to implement in hospital environments. And a recent study performed at UPenn raised alarm by claiming that CPOE can actually increase the potential for medical errors. Indeed, experts agree that CPOE can introduce new risks if not designed and implemented correctly, or does not fit in smoothly with a hospital's particular "work flow." CIOs ready to invest millions of dollars in CPOE need to make sure that IT staff work closely with their medical counterparts to design the systems and provide extensive training for those who will use it. They should also partner with their vendor to customize the system for their own specific needs. And CIOs need to monitor the CPOE closely to make sure that glitches are fixed before they can cause unexpected medication errors.

CPOE projects are like many tricky enterprisewide implementations, and CIOs from health care and other industries can learn important lessons about change management from hospitals that have gotten CPOE right, including Brigham and Women's, Duke University Medical Center and Health System, Intermountain Health Care in Utah, and St. Joseph Health System in Orange County, Calif.

"The simple truth is that CPOE is not a turnkey solution," says Brian Strom, chair of the department of biostatistics and epidemiology at the UPenn medical school. "Getting it right takes a tremendous amount of monitoring and tailoring. No one expected Word 1.0 to be perfect, so it's not surprising that CPOE 1.0 isn't perfect either."

To Err Doesn't Have to Be Human

Until the turn of the 21st century, only a few major hospitals had attempted to design and implement CPOE systems. But then in November 1999, the Institute of Medicine published a report that galvanized the nation's medical community. The report, "To Err Is Human," put forth some disturbing figures. Avoidable medical mistakes kill anywhere from 44,000 to 98,000 people a year—more than breast cancer, highway accidents or AIDS. The report also said that more than 7,000 deaths are caused by medication errors.

CPOE quickly rose to the forefront of health IT systems as a promising means of preventing medical errors. Large vendors such as Cerner and McKesson developed and updated CPOE systems, and hospitals large and small began to adopt the new technology. The road has not always been smooth for those adopting the systems, however. In January 2003, in a high-profile case that spooked the medical world, doctors at Cedars-Sinai Medical Center in Los Angeles, unhappy with the extra time it took them to enter orders on the computer, staged a rebellion and forced the hospital to shelve the CPOE portion of a $32 million implementation project after three months of use. Then, in March of this year, researchers at UPenn published a study in the *Journal of the American Medical Association* (*JAMA*) documenting that their CPOE system, an early model from Eclipsys, could cause 22 types of medication error risks. The researchers, led by Ross Koppel, a sociology professor at the UPenn School of Medicine, surveyed staff using the CPOE and shadowed doctors, nurses and IT staff to see how they used the system. One risk discussed in the study was the difficulty staff had in discerning which patients the doctor was ordering for, because the CPOE display was fragmented and required switching between multiple screens. Such clunky features increased the risk for faulty orders on a regular basis, the study found.

The UPenn study generated heated discussion and dozens of

Feds Sweeten the Pot

Medicare will offer discounts to doctors interested in installing automated systems

MOVING FROM PEN AND PAPER to the computer doesn't come cheap in the medical world. According to a 2003 study by First Consulting Group, implementing computerized physician order-entry (CPOE) at a single, 500-bed hospital costs an estimated onetime $7.9 million, with ongoing annual costs of $1.35 million. And that estimate assumes that the hospital already has high-capacity network capabilities. John Glaser, CIO at Partners HealthCare, adds that CPOE doesn't necessarily lead to revenue gains so hospitals stretched for cash may not be able to justify the expense.

On a national level, the Department of Health and Human Services is getting ready to offer low-priced software for electronic medical records (EMRs) to doctors treating Medicare patients in smaller offices. Officials at the Center for Medicare Services say medical practices that install the VistA-Office software, which was developed by the Department of Veteran Affairs, will spend $10,000 to $12,000 on implementation, while the purchase and installation of other EMR systems could cost as much as $100,000 for a five-physician private practice. The VistA software—which has been used in VA hospitals and clinics for two decades—should ease the way for adoption of CPOE systems in hospital and office settings. *–S.P.*

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editorials in medical journals. Critics castigated the study for failing to compare data from the pen-and-paper era and for focusing on what many consider an out-of-date system that is not representative of systems widely in use today. But CPOE experts say that, nonetheless, the study highlighted some important truths about the difficulty of implementing CPOE. And the UPenn researchers say that more recent studies on a newer system show that while the doctors and nurses prefer it to the former system, the new system has not solved all the original problems that could lead to medication errors. Most notably, the structure and format of the screens can still cause medical staff to prescribe drugs for the wrong patient, the researchers say.

All of this debate comes as hospitals are facing increasing pressure from the government and patient safety groups to install systems such as CPOE and electronic medical records (EMRs), which replace paper files by placing medical and patient records on a computerized system. The U.S. Medicare system recently announced plans to offer lower-priced medical records software to doctors. (See "Feds Sweeten the Pot" on Page 80.) So far, slow adoption of CPOE and EMRs has been attributed to lack of funding and physician resistance. The difficult experience at Cedars-Sinai highlights the scope and amount of preparation needed to implement large-scale clinical systems. A move to CPOE can have a serious impact on the way that doctors and nurses do their work, and those hospitals that have been successful with CPOE have worked to avoid the kinds of disruptions that have made clinicians shy away from using the systems.

"CPOE will be the biggest clinical change initiative most hospitals have ever undertaken," says Dr. David Classen, who helped design the CPOE system at Intermountain Health Care in Salt Lake City and is now a consultant on CPOE to The Leapfrog Group, a Washington, D.C.-based health-care consortium.

How to Get It Right the First Time

Hospitals going through this massive change need to first focus on how doctors do their work to avoid inconveniencing them with additional tasks, says Asif Ahmad, CIO of Duke University Medical Center and Health System. Ahmad, who implemented CPOE at Ohio State University before coming to Duke, says the key to success lies in working closely with the doctors and nurses to help design the system, even if using vendor-built software. At Duke, Ahmad cochaired the CPOE task force with the hospital's chief medical officer, and within his IT department, there are six physicians as well as 30 nurses and four pharmacists reporting to him. "It's imperative that CIOs in hospitals build technical and clinical teams," he says. "People responsible for building or overseeing CPOE systems need to understand the clinical system." Although Duke bought its CPOE system from McKesson, doctors helped customize it to fit in with their way of doing things. When a doctor or nurse clicks a button to admit a cardiac patient, for example, the system shows them tasks and treatments such as administering aspirin.

"If physicians help design CPOE, and it's done the right way, it's not going to cause errors," Ahmad says.

Duke's CPOE system, which went fully live on all 590 patient beds as of June 20, includes 259 "order sets," specific instructions for standard medical procedures that were jointly developed by physicians. "The idea was to get all the cardiologists in one room and tell them they can't leave until we agree on a set of directions on how to manage patients," he says. "Sometimes there are personal preferences but we have to agree to make the system work." During the first nine months of the process, he held regular meetings with doctors and nurses to map workflow for each speciality and unit of the hospital. As a result of these meetings and close consultation with medical staff, the team of doctors and IT staff were able to avoid design problems they viewed as potentially harmful to patient safety. For example, the design team made sure that information on a single patient remains on the same page or screen and staff cannot swing to another patient's page until the orders have been completed for the initial patient. "If you display more than one patient on the same screen, you have a greater potential for error," Ahmad says.

Ahmad also says doctor input pushed the IT team to create a "single sign-on," which allows physicians to look at test results on one system and then move into the CPOE system without having to log out and log in again. And in order to combat "alert fatigue," Ahmad says Duke is working on building a corollary system that will send most alerts outside of CPOE. Then, doctors will be able to do their work without the

How to Get CPOE Right

1. **Involve doctors and nurses** from the start in designing the system. Encourage doctors to join in the effort by designating champions among the medical staff.
2. **Partner with your vendor** to make sure it will make changes to the system in response to suggestions or complaints from medical staff.
3. **Train staff extensively** and continue to provide help, preferably from fellow clinicians, once they are using the system.
4. **Monitor the systems closely** after they are up and running. Be ready to fine-tune the system and make changes for years to come.
5. **Look for the new tool,** sponsored by The Leapfrog Group, which will help hospitals evaluate the effectiveness and safety of their CPOE systems.

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"If physicians help design CPOE, and it's done the right way, it's not going to cause errors."

–Asif Ahmad, CIO, Duke University Medical Center

nuisance of constant pop-ups telling them about interactions that are not dangerous to the patient. A select group of pharmacists, doctors and nurses monitoring this corollary system will be able to respond to serious alerts.

Big Bang Versus Gradual Approach

Benjamin R. Williams, CIO and senior VP of strategic innovation at St. Joseph Health System, an hour south from L.A., agrees that a close relationship with the medical staff is key to CPOE success. Williams watched closely as doctors rejected the system at nearby Cedars-Sinai and has carefully structured the CPOE initiative at his own network of community hospitals to involve doctors from the start. He designated champions of the system among the medical staff to convince more reluctant doctors to use the system. He also decided to phase the CPOE rollout over a period of several years and encourage doctors to use it, rather than force them to do so all at once, which is what Cedars-Sinai did. Phasing it in has also allowed his team to make fixes and respond to doctors' concerns about the system's design.

Dr. Thomas Hughes, an ob-gyn specialist at St. Jude Hospital, a part of the St. Joseph Health System, has served as a kind of liaison between doctors and IT staff. At one point, Hughes brought together a team of 41 doctors to help design the system, working with vendor Meditech. At St. Jude, 40 percent of admissions are now done using the system that includes CPOE, and about 60 doctors out of 280 are using the system regularly. A larger number use the system to check lab results, and Hughes hopes that he and his team will gradually be able to convince the rest to use computerized drug-ordering. Hughes said that by bringing in doctors who showed interest in using the system first, the hospital has been able to get started in a gradual and more positive way. Then, as the first enthusiastic doctors get used to the system, they will, he hopes, be able to convince more reticent ones to join them.

While some hospitals, including Duke, have been successful with quick, "big bang" types of rollouts, many CPOE veterans say that approach is generally more risky than a gradual implementation. While installing the system one hospital unit at a time can create confusion—especially if doctors and patients are moving between floors and wards that use CPOE and those that don't—most people who have experienced a CPOE implementation advise hospitals to take it slowly. "The gradual approach can be painful," says John Glaser, CIO at Partners HealthCare

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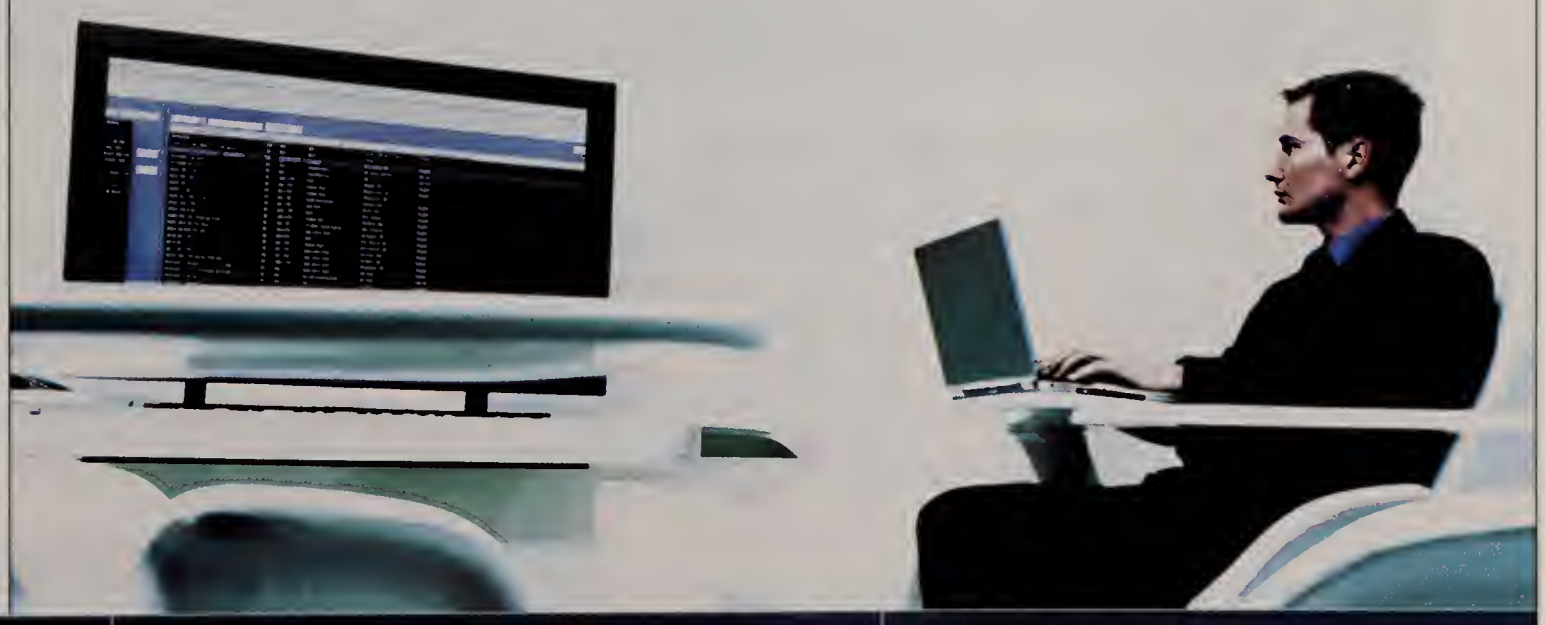

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System, which includes Brigham and Women's in Boston. "But given the risks, I'd rather give myself the opportunity to pause if there are problems."

To encourage doctors to use the system and to avoid inadvertent medication errors, Hughes suggests holding regular meetings and listening closely to doctor complaints. For example, the Meditech system in use at St. Jude's has nine levels of warnings on drug interaction. If all nine are activated on the system, everything a doctor orders will lead to a series of time-consuming pop-ups that are likely to be ignored. After consulting doctors, the hospital decided to activate only the two highest levels of warnings so that those using the system will read the pop-ups and possibly avoid making serious errors.

Doctors also convinced the IT team and Meditech to change the system to remove a function that forced them to "deselect" items and tests they did not want to perform. With this modification, the doctors are now required to select only what they want to order, saving considerable time.

Looking back at Cedars-Sinai's experience, Dr. M. Michael Shabot, Cedars-Sinai's medical director of enterprise information services, says that, at the time, there was little awareness of the difficulties involved in a large CPOE implementation. "Given the money and time that is spent on this system, it has to be meaningful to the physician," says Shabot. "The reason for it has to be very clear."

A Technology in Its Infancy

When the UPenn researchers published their CPOE study in *JAMA*, Williams was in the midst of his complicated CPOE project at St. Jude's. Williams acknowledges that after reading the *JAMA* study, he recognized some possible shortcomings in his own CPOE system. As a result, he recently requested the Meditech system provide a link between procedures and medication orders so that if the procedure (such as open-heart surgery) is canceled, the correlating medication order would automatically be canceled as well. In addition, his team is working closely with Meditech to improve integration of the pharmacy and physician order management to make sure that the orders are going through in real-time, without delay.

In a written response to the *JAMA* article, circulated among his staff, Williams wrote: "The safety and effectiveness of CPOE arises from the understanding that it is primarily a process change, a major transformation in the procedures surrounding the delivery of patient care."

Even those who question the study's methodology agree that it highlighted the stress that a CPOE rollout can put on a hospital and the need to constantly monitor and fix the systems. After implementing a homegrown system at Brigham and Women's, Dr. David Bates, chief of the division of general medicine, wrote in the *Journal of Biomedical Informatics*, "We routinely tracked errors and problems that were created, and made thousands of changes to the original application." If he had one thing to do over, Bates says he would have devoted even more resources to this area. "It is just impossible to get it all right at the outset, because the processes involved are so complex," he adds. And some say it is harder to make all of the necessary changes if you're installing a system designed by a vendor. Bates says, and other practitioners agree, that just as with any new technology, CPOE must be aggressively monitored and tinkered with if it is going to succeed.

"The gradual approach to CPOE implementation can be painful. But given the risks, I'd rather give myself the opportunity to pause if there are problems."

–John Glaser, CIO at Partners HealthCare System

The Leapfrog Group's Classen is leading a project to create what he calls a "CPOE flight simulator," which hospitals and outpatient clinics will be able to use to test their CPOE and decision support systems to gauge whether they "prevent or cause harm" among patients. "What's clear is that not all medication errors are created equal," Classen says. "We need to find the ones that cause harm or death."

CPOE experts hope such new tools will be able to test the effectiveness of the drug-ordering systems and help hospitals make them as foolproof as possible.

"Saying that 'CPOE causes medication errors' is like saying that 'cars cause accidents,'" Bates writes. "Of course CPOE can cause medication errors. Clearly we should strive to make it work better. Accident rates were high with cars early after their introduction, but few today want to go back to the horse and buggy." CIO

Senior Editor Susannah Patton can be reached at *spatton@cio.com*.

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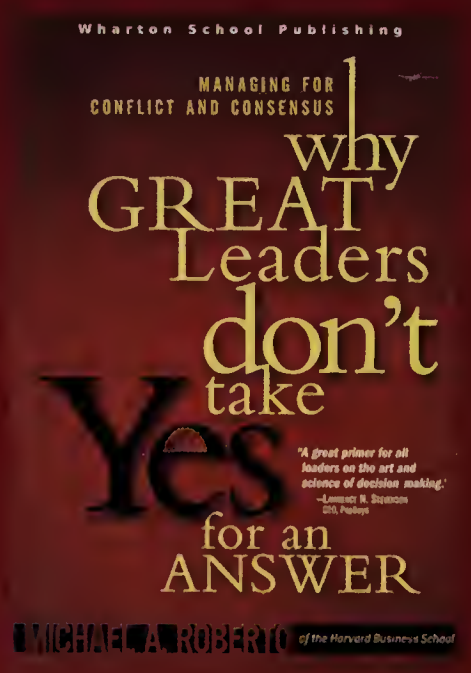
DECIDING HOW TO DECIDE

Good decisions arise from constructive conflict. Here's how to use debate to build a sound decision-making structure.

BY MICHAEL A. ROBERTO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Yes-men are widely scorned. Yet entire organizations often do no better at examining all sides of a problem, raising potential shortcomings of a proposed solution or suggesting alternatives, says Michael Roberto, assistant professor at Harvard Business School. Groupthink, deference to authority and fear of being embarrassed can lead managers—even experienced CXOs—to say yes to bad decisions. In *Why Great Leaders Don't Take Yes for an Answer: Managing for Conflict and Consensus*, Roberto shows why and how companies should stimulate constructive debate. By deciding how to decide, CIOs and other executives can make better decisions, build a real consensus for action, and understand the difference between a bad yes and a good yes.

Reader ROI

- The human and organizational biases that discourage good decisions
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Continued on Page 90 »

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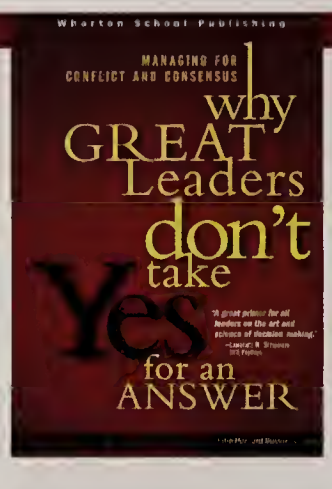

Continued from Page 88

How many of you have censored your views during a management meeting? Have you offered a polite nod of approval as your boss or a respected colleague puts forth a proposal, while privately harboring serious doubts? Have you immediately begun to devise ways to alter or reverse the decision at a later date?

If you have answered yes to these questions, be comforted by the fact that you are not alone. Many groups and organizations shy away from vigorous conflict and debate. For starters, managers often feel uncomfortable expressing dissent in the presence of a powerful, popular and highly successful chief executive. It becomes difficult to be candid when the boss's presence dominates the room. We also find ourselves deferring to the technical experts in many instances, rather than challenging the pronouncements of company or industry veterans.

Certain deeply held assumptions about customers, markets and competition can become so ingrained in people's thought processes that an entire industry finds itself blindly accepting the prevailing conventional wisdom. Pressures for conformity also arise because cohesive, relatively homogenous groups of like-minded people have worked with one another for a long time. Finally, some leaders engage in conflict avoidance because they do not feel comfortable with confrontation in a public setting. Whatever the reasons—and they are bountiful—the absence of healthy debate and dissent frequently leads to faulty decisions.

The Perils of Conflict and Dissent

Of course, dissent does not always prove to be productive; cultivating conflict has its risks. To understand the perils, we must distinguish between two forms of conflict. Suppose that you ask your management team to compare and contrast two alternative courses of action. Individuals may engage in substantive debate over issues and ideas, which we refer to as cognitive, or task-oriented, conflict. This form of disagreement exposes each proposal's risks and weaknesses, challenges the validity of key assumptions, and might even encourage people to define the problem or opportunity confronting the firm in an entirely different light. For these reasons, cognitive conflict tends to enhance the quality of the solutions that groups produce. As former Intel CEO Andrew Grove once wrote, "Debates are like the process through which a photographer sharpens the contrast when developing a print. The clearer images that result permit management to make a more informed—and more likely correct—call."

As former Intel CEO Andrew Grove once wrote, "Debates are like the process through which a photographer sharpens the contrast when developing a print. The clearer images that result permit management to make a more informed—and more likely correct—call."

Unfortunately, when differences of opinion emerge during a discussion, managers may find it difficult to reconcile divergent views. At times, people become wedded to their ideas, and they begin to react defensively to criticism. Deliberations become heated, emotions flare, and disagreements become personal. Scholars refer to these types of personality clashes and personal friction as affective conflict. When it surfaces, decision processes often derail.

Unfortunately, most leaders find it difficult to foster cognitive conflict without also stimulating interpersonal friction. The inability to disentangle the two forms of conflict has pernicious consequences. Affective conflict diminishes commitment to the choices that are made, and it disrupts the development of shared understanding. It also leads to costly delays in the decision process, meaning that organizations fail to make timely decisions, and they provide competitors with an opportunity to capture advantages in the marketplace.

Why Is This So Difficult?

Why is managing conflict and building consensus so challenging? The roots of the problem may reside in one's style of leadership. Often, however, the difficulty reflects persistent patterns of dysfunction within groups and organizations. Let's try to understand a few sources of difficulty that leaders must overcome as they shape and direct decision processes.

Leadership style. Leaders may have certain personal preferences and attributes that make it difficult to cultivate constructive conflict and/or build consensus within their organizations. For instance, some executives may be uncomfortable with confrontation, and therefore, they tend to avoid vigorous debates at all costs. They shy away from cognitive conflict because loud voices and sharp criticism simply make them uneasy. Others may be highly introverted, and consequently, they may discover that their employees find it difficult to discern their intentions as

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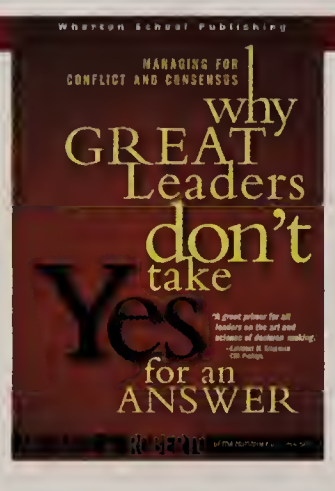

well as the rationale that they have employed to make decisions.

Some executives prefer to manage by fear and intimidation, and they enjoy imposing their will on organizations. That leadership style also squelches dissenting voices, and it can leave employees feeling unenthusiastic about a proposed plan of action that they did not help to formulate. Of course, a few extraordinary leaders foster enormous levels of commitment while employing this approach.

Consider, for instance, the management style of Bill Parcells, the famous professional football coach. He has dramatically turned around four very unsuccessful franchises over the past two decades, and his teams have won two world championships. He thrives on confrontation, instills a great deal of fear in his players, and makes decisions in a highly autocratic fashion. Yet, players put forth an incredible effort for Parcells, and they frequently express an intense desire to please him, despite the fact that he makes their lives difficult at times. In general, however, success often proves difficult to sustain over the long haul for those who employ this leadership pattern. Perhaps that explains why Parcells has chosen to shift frequently from one team to another during his coaching career.

Cognitive biases. A few mental traps also stand in the way as leaders try to manage conflict and consensus. For instance, most individuals search for information in a biased manner. They tend to downplay data that contradicts their existing views and beliefs, while emphasizing the information that supports their original conclusions. This confirmation bias explains why leaders may not aggressively seek to surface dissenting views, or why they may not listen carefully to those voices. Naturally, managers become frustrated if they perceive that leaders are processing information in a biased manner, and that disappointment can diminish buy-in. Overconfidence bias becomes a factor in many situations as well. Most of us tend to overestimate our own capabilities. Consequently, we may not recognize when we need to solicit input and advice from others, or we downplay the doubts that others display regarding our judgments and decisions.

Threat rigidity. In many cases, strategic decision making occurs in the context of a threatening situation—the organization must deal with poor financial performance, deteriorating competitive position and/or a dramatic shift in customer requirements. When faced with a threatening context, the psychological stress and anxiety may induce a rigid cognitive response on the part of individuals. People tend to draw upon deeply ingrained mental models of the environment that served them well in the past. Individuals also constrict their information-gathering efforts, and they revert to the comfort of well-learned practices and routines.

This cognitive rigidity impairs a leader's ability to surface and discuss a wide range of dissenting views. To make matters worse, factors at the group and organizational level complement and reinforce this inflexible and dysfunctional response to threatening problems. Consequently, organizational decision processes become characterized by restricted information processing, a constrained search for solutions, a reduction in the breadth of participants, and increased reliance on formal communication procedures.

In-groups versus out-groups. As people work together throughout the decision process, they have a natural tendency to categorize other members of the groups in which they interact. They classify some people as similar to them (the in-group) and others as quite different based on a few salient demographic characteristics or professional attributes (the out-group). For instance, an engineer may distinguish those group members with similar functional backgrounds from individuals who have spent their careers working in finance or marketing. In general, people tend to perceive in-group members in a positive light and out-group members in a negative light. These perceptions shape the way that individuals interact with one another. Highly divisive categorization processes—those circumstances in which people draw sharp distinctions between in-groups and out-groups—can diminish social interaction among group members, impede information flows and foster interpersonal tensions.

Individuals also appraise other group members in terms of personal attributes such as intelligence, integrity and conscientiousness. Unfortunately, a person's self-appraisal often does not match the

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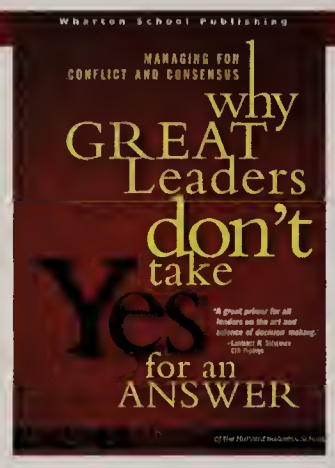

view that others have. An individual may see himself as highly trustworthy, whereas others have serious doubts about whether he is reliable and dependable. When individuals tend to see themselves in a manner consistent with others' views and perceptions, groups perform more effectively. If many perceptual disconnects exist within a group, people find it difficult to interact constructively. It becomes difficult to manage disputes and lead deliberations smoothly.

Organizational defensive routines. Organizations often develop mechanisms to bypass or minimize the embarrassment or threat that individuals might experience. Managers employ these defensive routines to preserve morale, make bad news a bit more palatable and soften the impact of negative feedback. They want people to remain upbeat and positive about the organization's mission as well as their own situation. For instance, in many firms, we witness the existence of an implicit understanding of the need to employ a routine for helping employees to save face when they have failed. Unfortunately, such behaviors depress the level of candor within the organization, and they make certain issues "undiscussable."

Over time, these defensive practices become deeply ingrained in the organizational culture. They do not occur because a specific individual wants to avoid embarrassing a colleague, but rather because all managers understand that this is "the way things are done around here." Leaders often find it extremely difficult to dismantle these deeply embedded barriers to open and honest dialogue.

A Deeper Explanation

All the factors described previously certainly make it difficult to manage conflict and consensus effectively. The core contention of this book, however, is that many leaders fail to make and implement decisions successfully for a more fundamental reason—that is, they tend to focus first and foremost on finding the "right" solution when a problem arises, rather than stepping back to determine the "right" process that should be employed to make the decision. They fixate on the question, "What decision should I make?" rather than asking "How should I go about making the decision?" Answering this "how" question correctly often has a profound impact on a leader's decision-making effectiveness. It enables leaders to create the conditions and mechanisms that will lead to healthy debate and dissent as well as a comprehensive and enduring consensus.

Naturally, leaders also must address the content of critical high-stakes decisions, not simply the processes of deliberation and analysis. They have to take a stand on the issues, and they must make difficult trade-offs in many cases. Moreover, creating and leading an effective decision-making process does not guarantee a successful choice and smooth implementation. However, developing and managing a high-quality decision-making process does greatly enhance the probability of successful choices and results.

What Type of Leaders?

Jim Collins, arguably the most widely read business writer in the world, conducted a study to determine how and why some companies move from a fairly long period of average financial performance to an era of sustained superior results. He found that only a small set of firms managed to make that leap, and their leaders possessed a distinct set of traits. According to Collins, the CEOs of those firms demonstrated great modesty and humility. They often proved quiet, reserved and even shy. Collins extols those virtues, and he argues that organizations should seek leaders with these attributes, rather than simply chasing individuals who exhibit charisma.

There are two approaches to taking charge. One kind of leader dives right into the problem, trying to find the best solution. A second type of leader takes a step back and focuses at first on how the organization ought to go about tackling the problem.

Tom Peters, another widely read business writer and consultant, disagrees vehemently. He thinks the current tumultuous business climate requires something quite different from the "stoic, quiet, claim leaders" that he hears Collins describe and extol. Peters exclaims, "Would you like to think that a quiet leader will lead you to the promised land? I think it's total, utter bull, because I consider this to be a time of chaos."

Effective leaders do take charge when confronted with difficult organizational decisions. However, there are two different approaches to taking charge. One kind of leader dives right into the problem, trying to find the best solution. This type of leader focuses on *what to do* to improve the organization's performance. A second type of leader takes a

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_DAY 10: I...am...losing...my...mind. Too many servers. Too many operating systems. Too many databases. Nothing's integrated.
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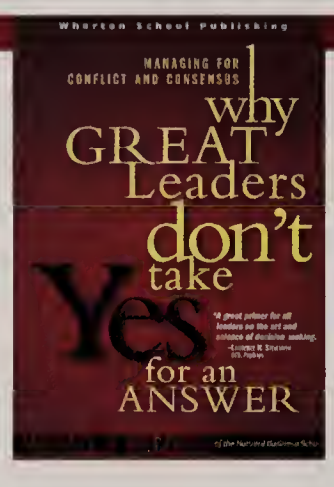

step back and focuses at first on *how* the organization ought to go about tackling the problem. This leader asks the question: What kind of decision process should we employ? This is not to say that the leader does not have an opinion about what to do, but he does not focus exclusively on finding the right *solution*. Instead, he focuses first on trying to find the right *process*.

Consultant and researcher David Nadler has argued that many top executives do not distinguish between these two approaches to taking charge. They believe that working with others in a collaborative problem-solving fashion signifies a shift toward "letting the team manage and decide for itself." Nadler tries to clarify this misconception. He believes that leaders can be directive about a decision-making process, while providing subordinates plenty of room to offer divergent perspectives regarding the content of the issue at hand.

During the Cuban missile crisis, President Kennedy became more directive about the decision process. He made careful choices about composition, context, communication and control—the 4 C's that together comprise how a leader decides how to decide. Kennedy considered how the deliberations should take place, what roles people should play in the process and how divergent views should be welcomed and heard. Yet he removed himself from several meetings. He resisted the temptation to micromanage all details of the situation. He offered his advisers some room to state their arguments, to debate one another and to revise their proposals based upon the critique of others. Kennedy still retained the right to make the final call, and he clearly did not strive for unanimous agreement before moving forward. The president took charge of the decision process, knowing that he would not lose authority or control by offering others an opportunity to express their views. No one perceived Kennedy as weak or indecisive because he stepped back to give others room to state their case before he declared his own views on the matter.

Top executives will demonstrate true decisive leadership when they think carefully about how they want to make tough choices, rather than by simply trying to jump to the right answer. By deciding how to decide, they increase the probability that they will effectively capitalize on the wide variety of capabilities and expertise in their organization and make a sound decision. Moreover, they enhance the odds of being able to implement the chosen course of action effectively.

By deciding how to decide, top executives increase the probability that they will effectively capitalize on the wide variety of capabilities and expertise in their organization and make a sound decision.

Leading with Restraint

The brand of take-charge leadership called for in this book requires a great deal of restraint on the part of top executives. When faced with a complex problem, many executives will have a strong intuitive feeling about what to do based upon years of experience. That intuition will prove correct in many circumstances, but not all.

To make the most of the expertise and ideas that other members of their organizations possess, leaders need to refrain from pronouncing their solution to a problem before others have had an opportunity to offer their perspectives. They must acknowledge that they do not have all the answers, and that their initial intuition may not always be correct. They need to recognize that their behavior, particularly at the outset of a decision process, can encourage others to act in an overly deferential manner. Leaders must understand that the best choices mean very little if various, interdependent units of the organization are not willing to cooperate to execute the decision.

By leading with restraint, individuals in positions of authority recognize that their understanding and knowledge in a particular domain are often bounded, imprecise and incomplete. They do not begin to tackle a problem by seeking confirmation of their preexisting hypotheses, but instead recognize the existence of boundary conditions associated with each of their mental models (i.e., their theories may apply under certain conditions, but not in all circumstances). Restrained leaders implicitly presume that their understanding of a specific domain consists of a set of nascent theories, which may be disproved over time and about which reasonable people may disagree. Restrained leaders constantly search and explore for new knowledge, rather than seeking the data and opinions that confirm their preexisting understanding of the world around them. CIO

Author Q&A

To read Executive Editor Edward Prewitt's interview with author Michael Roberto, go to **www.cio.com/110105**.

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_DAY 39: I came in today and found them invading the snack room. I thought I'd gone insane, but Dwayne sees them, too.

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How to Do a Pain-Free IT Reorganization

Spend enough years as a CIO, and odds are good that you will preside over the reorganization of an IT department or two. When you sign on with a new company, "overhaul dysfunctional IT organization" may be at the top of your to-do list. Or perhaps a need to slash the IT budget, digest a spate of acquisitions or respond more nimbly to market demands will spur a departmental shake-up.

Whatever the reason, a reorg's success hinges on the same best practices that underlie any IT-business endeavor. We asked CIO Executive Council members for tips on how to reap the most gain for the least pain from an IT reorganization. Here's what they advised.

1] Make sure business strategy drives the reorganization. Too often, a reorg is a knee-jerk response to some fleeting external pressure, such as a call to cut costs or better cater to a cranky group of internal customers, rather than a well-thought-out and well-aligned move. "Don't reorganize just because you're the newbie, or because it's been a year since the last reorg," says Brent Stahlheber, executive VP and CIO of The Auto Club Group (AAA). "Make a change where change is truly needed."

During Stahlheber's interviews for the CIO post at The Auto Club, for example, he learned about problems with the decentralized IT organization. "It was clear that it wasn't working around applications and infrastructure," he says. "They weren't rowing in the same direction." Once Stahlheber took the job, though, he did not rush to reorganize: He spent six months on reconnaissance, talking with business leaders and IT staff to understand the company's product lines, market environment and business strategy. Only then did he embark on a centralization initiative.

JODY DAVIDS
EVP and CIO,
Cardinal Health

At other companies, the link between an IT reorg and business strategy may be more overt. Cardinal Health's IT centralization effort, for example, is part of a companywide global integration plan called One Cardinal Health. "[The plan] is about making it easier for customers to do business with us by partnering across our internal business boundaries to offer them integrated services," says Jody Davids, Cardinal Health's executive VP and CIO. The first step of the plan was the recently completed IT reorganization, which combined a decentralized IT staff of 1,700, spread across all of Cardinal Health's business units,

[ONE::LINER]

"In IT reorganizations, there's a fine line between change and chaos, and you need to be careful that you don't walk over to the chaos side."

–BRENT STAHLHEBER, EXECUTIVE VP AND CIO, THE AUTO CLUB GROUP (AAA)

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[PEER COUNSEL]

Q: How involved should your IT outsourcers be in planning an IT reorganization, especially in a company that's becoming more centralized?

A: Outsourcers view a company's move to centralize in two ways: They see it as a potential growth opportunity, but they also see it as a threat—a threat that the company may decide it can do things better, faster and cheaper in-house and therefore no longer needs the outsourcer. We learned during our IT centralization initiative that it might have been smarter to bring a representative from our outsourcer onto the reorg team at the start. That way we wouldn't have had to manage a separate set of communication and change-management issues around vendor-relationship concerns.

PAUL LAWLER
SVP, Enterprise Technology, Cendant

I don't mean that you should take vendors inside and make them privy to all the nitty-gritty. But if you at least include your vendors in steering committee meetings, there's open communication. At Cendant, we have since brought our vendor into the communication loop, involving it in status meetings, and that's been very helpful.

This involvement has built trust in the relationship, which is important regardless of the outcome of the centralization initiative. Through transparent dialogue with the vendor, we were able to identify potential issues in the centralization initiative that we might have missed without the exchange of information between our teams. This created an atmosphere of partnership that allowed us to be honest across company lines, benefiting both parties.

Even if the outcome of an IT centralization initiative is a significant change in an existing outsourcing relationship, the trust built during this process allows both parties to maintain the relationship into the future, potentially providing new opportunities to work together that might not have been apparent otherwise.

–Paul Lawler, Senior VP, Technology Operations, Cendant

Pain-Free IT Reorganization

Continued from Page 98

into a single, global enterprise IT organization. Over the next five to seven years, Cardinal Health will be moving to a single ERP platform and ultimately to common technologies across the globe.

2] Involve business stakeholders in planning. An IT reorg affects the entire business—not just the IT department—so CIOs should consult with business peers from the start to win their support as early in the effort as possible. Davids kicked off Cardinal Health's reorg by asking business clients how they perceived IT. Armed with both positive comments and suggestions for improvement, Davids shared their answers with her IT staff, thereby building the rationale for change. Cardinal Health's executive committee, of which Davids is a member, gave her feedback on the reorg strategy, vision and top-level organizational structure. "I had support from the top, which made [the reorg] a lot easier," she says.

3] Give IT staff a role in planning. In addition to reaching out to the business side, give front-line IT staffers a formal role in reorg planning so that they can express concerns and help others understand the day-to-day impact of proposed changes. Paul Lawler, senior VP of technology operations at Cendant, says that midway through Cendant's reorg, he formed an IT employee council made up of one strong team leader from each functional group (operations, project management, end-user services, relationship management and so on).

4] Build a plan—and plan enough time. Executing a reorg can eat up a surprising amount of staff time, both for the CIO and the CIO's top lieutenants: You'll need to allot time for meetings to design the new structure, and time to communicate changes to employees and business clients. In some cases, you'll have to interview employees for newly created roles or train them on new systems and procedures. Davids estimates that during Cardinal Health's six-month reorg, her 12 direct reports devoted 50 percent to 60 percent of their time to the effort; during a three-month period, her direct reports' staff also devoted 50 percent to 60 percent of *their* time to the reorg.

5] Grant critics a voice. During reorg discussions, don't be surprised if the decentralists come out of the closet, says Lawler. "Suddenly, people who have always wanted to take back control over IT will come out and be naysayers." In hindsight, Lawler says, it would have been wise to put a naysayer or two on the reorg steering team. That way, they could have raised their objections as part of the team rather than from the sidelines.

Sari Kalin is a freelance writer based in Arlington, Mass. Send feedback on this story to *letters@cio.com*.

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CASE STUDY

TEASING APART I.T. DEMAND AND SUPPLY

Depending on the business

pressure du jour, large IT shops tend to swing back and forth from one organizational model to another. Need to save money and promote technology standards across the organization? Centralize. Need to respond more quickly to local market demands and better align with the business? Decentralize. "It's a constant tension between the two extremes of the pendulum," says Ron Kifer, senior VP and CIO for the United States and Canada at DHL Express.

The global transportation and logistics services giant began centralizing and consolidating IT infrastructure and services six years ago, building a massive computing supercenter in Kuala Lumpur to manage IT for most of its operations in the Asia-Pacific and emerging markets, Kifer says. Two years ago, DHL opened a supercenter in Scottsdale, Ariz., to consolidate IT for the United States, Canada, and parts of Central and South America; and this year, the company set up a supercenter in Prague to condense IT for most of Europe and the Mediterranean.

While centralization drove down costs, it did make it harder for business units to ensure that IT spending was in sync with business strategy. "It was difficult to get the right people from the business together with the right people from IT to define project requirements in a manner that was suitable for design and specification," Kifer says. Multiple iterations of project requirement specs were continually shifting between the business and IT (because of their remoteness to each other), adding cost and time to project lifecycles, he says.

Today DHL has embarked on an IT transformation that aims to give it the best of both worlds. The arrangement separates the supply side of DHL's IT organization from the demand side, and it puts IT demand management under the business's control. "Demand CIOs" report to regional CEOs and manage the region's IT budget, Kifer says, to better align IT spending with business strategy. The demand-management function—Express Business IT (EbIT)—is staffed by IT employees who were previously focused on demand-management aspects of IT.

Under the new model, Kifer says, DHL will be able to reap the cost savings of its centralized computing supercenters—and the alignment benefits of having IT closely tied to regional operations. All regions of DHL are adopting this organizational model. While regional teams are in charge of implementing the EbIT functions within their regions, Kifer says, a "thin global group" under a single CIO is coordinating to ensure a consistent approach, standards, processes and tools from region to region. DHL also has a global corporate transformation office supporting this initiative.

RON KIFER, CIO, DHL EXPRESS

For many employees, the reorganization means a dramatic change in roles, reporting relationships and processes, Kifer says. DHL's change-management plan emphasizes education and training to help employees understand the benefits of these changes to the company as a whole—and to them personally. *–S.K.*

Communications Toolkit

Talking Points

CIO Executive Council members say that during an IT reorg, it's crucial to communicate early and often, both inside and outside IT. Communication can head off anxious speculation and help employees embrace new roles and the department's new direction. It can also help ensure that business stakeholders understand how the reorg is going to change the way they work with IT.

Here are some tips from Executive Council members:

» **Appoint a trained communication specialist** or hire a communication consultant to help craft messages for key stakeholders (employees, and internal and external customers).

» **Use as many vehicles as possible** to reach IT employees: E-mail weekly newsletters to staff to update them on the reorg's progress, hold town hall meetings, provide webcasts to remote offices, set up a Web portal that shows the latest news, or try an IT employee blog.

» **Build a portal for IT users** that explains the new structure and spells out how to do business with the IT group post-reorg.

» **Consider whether external customers** need to know about the IT reorg, and work with salespeople to craft a communication strategy.

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Going Mobile

Mobile computing continues to transform business

Bill Gates got it right in 1990 when he and Microsoft shared a vision of the future they called "information at your fingertips." Four years later, during a Comdex Fall keynote, Gates saw a world where personal computers, fax machines and new computer-based devices will "give us continuous access to all kinds of information."

I was thinking of Gates' comment during a recent conversation with Andy Brown, CTO at Merrill Lynch. During a panel discussion on new technology, Brown said, "[CIOs] underestimate the disruptive power of mobility."

As CIOs plan ahead for 2006, mobility, empowered by those new computer-based devices, is changing the way companies do business.

At the August CIO 100 Symposium, I moderated a panel on mobility with John Chen, CEO and president of Sybase; Kent Mathy, president of the Business Markets Group of Cingular Wireless; and John Davies, vice president and director of Intel Solutions Market Development Group. I asked the audience if they expected their employees to be more mobile a year from now than they are today. Most hands went up. They stayed up when I asked if it was more difficult to build a mobile enterprise. But a lot of hands came down when I asked, "Is your infrastructure optimized for mobility?"

Most businesses have, or are, mobilizing e-mail. Fewer are making their business applications mobile and fewer still are restructuring their business processes for mobile access. And when you factor in extending internal infrastructures to supply chain partners and external customers, the challenge becomes even greater.

Davies offered an interesting piece of advice to CIOs who want to untether their firms. Mandate that future PC purchases be mobile machines rather than desktops. Davies claims that did the trick at Intel.

Before our very eyes, eBusiness is morphing into "mBusiness," a concept authored by Ravi Kalakota and Marcia Robinson in their 2001 book *M-Business: The Race to Mobility.*

For background music, as you finalize your 2006 business plan, I suggest playing "Going Mobile" by The Who. Andy Brown is right. Mobility is the most disruptive technology you need to get your arms—and your employee and customer fingertips—around, and fast.

Gary J. Beach

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summaries

St. Joseph Health System CIO **Benjamin R. Williams:** "The safety and effectiveness of CPOE arises from the understanding that it is primarily a process change."

76 | THE RIGHT DOSE OF TECHNOLOGY HELPS THE MEDICINE GO DOWN

EARLY EXPERIENCES with computerized physician order-entry (CPOE) systems reveal that success involves much more than rolling out software. It's well-known that these systems are expensive and difficult to implement, but what has recently become clear is that CPOE can actually increase the potential for medical errors if not designed and implemented in a way that meshes with hospital work flow. CIOs contemplating investing millions in CPOE need to make sure that their IT staff works closely with their medical counterparts both to design the system and to provide extensive training for those who will use it. IT also needs to partner with the CPOE vendor so the system can be customized to fit a hospital's specific needs. And CIOs need to monitor the CPOE closely to make sure that glitches are fixed before they cause medication errors. *By Susannah Patton*

40 | COVER STORY
.NET, WEB SERVICES AND THE END OF THE VENDOR ERA

JUST A FEW YEARS AGO, CIOs were worrying that .Net, the software architecture Microsoft advertised as revolutionary, was just another way for Redmond to lock them in to Microsoft products. But then Web services standards happened and .Net evolved into a tool that worked in most development environments. Now, after decades of holding customers captive inside walls of proprietary software, Microsoft and its competitors are selling products such as .Net that help tear down those walls. Why? The market, driven by CIOs, made them do it. The CIO's world is now tilting toward platform-neutral business services. At the same time, the CIO role, once defined by the technology architecture you bet on, is now being judged by the value of the services you roll out to your users, partners and customers. CIOs need to reassess what they do and how they do it. *By Scott Berinato*

52 | COVER STORY
ARE YOU READY FOR WEB SERVICES?

THOUSANDS OF COMPANIES use Web services every day, but thousands more have yet to take the plunge. For those CIOs trembling on the brink of this great, revolutionary adventure, the risk is great and the questions are many. Is your company positioned to benefit from Web services? Are its business processes sufficiently understood to leverage the technologies? Is your IT staff equipped with the technology know-how and business sophistication to make Web services truly valuable? To find out for sure, take this quiz to assess your own Web services readiness quotient. *By Christopher Lindquist*

59 | THE FOUR (NOT THREE, NOT FIVE) PRINCIPLES OF MANAGING EXPECTATIONS

FOR MANY CIOS, managing the expectations of senior executives, end users and IT staff is the most difficult part of any project. A failure to address constituent expectations can undermine a CIO's credibility. In the process of rolling out a $500 million, state-of-the-art global network for the Society for Worldwide Interbank Financial Telecommunication, CIO Joe Eng developed four principles for expectation management to ensure that all his stakeholders knew what they would be getting, when they would get it and what problems might arise. His principles rely on ongoing frank communication, creative planning and deft diplomacy, and can (and should) be used by any enterprise for any project. *By Allan Holmes*

68 | SEEING NO EVIL

IF WATER UTILITIES can be required by state and local governments to deliver water that's clean and acceptable to drink, why can't ISPs be required to deliver data over the Internet that is similarly safe and threat-free? Why shouldn't ISPs be held accountable for cleaning up their networks? Why can't they monitor traffic as it passes through their pipes, looking for and shutting down maliciousness of all kinds? Increasingly, CIOs want answers to these questions, as the right ones might free them from the burden and costs of Internet security. And as the Internet becomes ever-more dangerous, it's beginning to look like the government is also seeking answers. *By Matt Villano*

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